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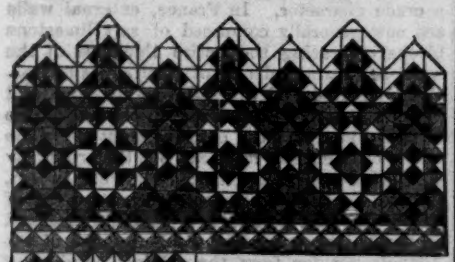
Art and Social Science.



THE Social Science Congress which will meet at Aberdeen next week the experiment which was commenced at Liverpool last year, of treating art as a separate subject in relation to the science of social well-being, will be repeated; and it will be a matter of some interest to see whether the class of subjects included under this new section can really be treated so as to yield practical results and justify the new classification. In such cases it is the second trial that often decides in great measure the success or non-success of an experiment; for as such the Art Section must, so far, we think, be regarded. The success of this part of the meeting at Liverpool last year was almost a foregone conclusion, so far as the interest of the moment went: the novelty of the idea, and the fact that Liverpool had become recently again a place of considerable interest for artists, together with personal influence, drew to the meeting some of our most eminent artists, and the papers and discussions that ensued were without doubt very interesting for an audience to listen to. Whether the practical conclusions arrived at were in proportion to the ability and eloquence of some of the papers, is a question which, perhaps, could not be so unhesitatingly answered. We printed a fair proportion of the addresses, and took occasion to enforce their teaching in some instances, and thus so far allied ourselves with the scheme.

But it can scarcely be denied that there was on that occasion a certain amount of talk,—some of it good, some of it not very good, but which, whether bad or good, did not go for much beyond talk. And that this should be so it was very natural to expect from the peculiar relation in which this section stands to the real object of the Social Science Association, the amelioration of the conditions of life in the community: but it would be well for those who will be concerned with the coming meeting to bear in mind the special difficulty in bringing the consideration of this class of subjects to a practical result.

Art cannot be treated *per se* by the Social Science Association: it must be art in its relation to social well-being; that is to say, as an influence in rendering the condition and circumstances of life in general better and happier; or, as the prospectus of the association words it, all questions may be dealt with which bear upon art "considered in relation to the civilisation, education, and industrial development of the people, and on the best methods of cultivating a sound and high standard of taste in all ranks of the nation." This assumes, of course, that the existence of a sound and high standard of taste is a state of things conducive to social well-being, and to be desired on that account; and so in one sense we unquestionably hold that it is. But it is not so in that distinctly logical sense of cause and effect in which healthy houses are said to be a condition of well-being. There are those who would even say (and among them are some of the most powerful minds of the day) that what is called a cultivated taste for art is at best a matter of very secondary and arbitrary importance, at worst a pretence and illusion, so far as the best ends of life are concerned: and those who reason so might make a strong point by citing the example of the Italian society of the Renaissance, in which almost all the most serious evils of society, private vice and luxury, public tyranny, hatred, and perfidiousness of the deepest dye, co-existed with the most refined and critical taste and the highest artistic power. But in addition to this puzzling question of art and morality, there is the additional difficulty that we are not even agreed as to what we mean or what we profess to want by art, in the same way that we are in regard to other subjects of discussion. When we take up such questions as those in the sanitary department, we all know what we want in discussing the question of providing better accommodation for the labouring classes, or improving the sanitary condition of the population engaged in the coast fisheries; and if we differ as to the means of doing this, there is the ultimate practical test of statistics and experience to revert to. But in the other case we are not all even agreed as to what we precisely mean by art; and even if we are, the results of certain conditions of artistic practice and artistic teaching are hardly capable of being put into any definite statistical tables. In reality, therefore, the Art Section appeals not to absolute science, to definite knowledge resulting from investigation; but in a great measure to the critical faculty, and it is in this respect that it stands on a somewhat different footing from all the other sections. If we say that we confine the investigations of the section to the results of methods of instruction, and to the question of economy in regard to the disseminating of works of art and of education in art, this really bars us out from that which is most keenly interesting—the art itself, the questions of style and feeling and aim, and all those deeply-interesting subjects which come under the head of art-criticism; and even in this case we seem to have no scientific ground to occupy, since, after we have shown, statistically perhaps, that some special method of teaching has proved the most attractive, and led to the best progress among the pupils of our schools of art, we may have the question suddenly and unexpectedly taken out of the ground of science into that of criticism, by the objection that the whole system is wrong, that what it produces is not art in the truest sense, and so on; a question which might be raised in such a way as obviously to go to the root of the whole matter, and change the whole view of the subject, and which yet would be entirely critical and not scientific. We may illustrate the case by supposing a Literature Section (and there is no reason why there should not be one as well as an art section), in which a discussion might take place on the best system of literary training for a novelist, and statistics might be introduced giving a definite test by the extent of sale of various novels; but all this would be overthrown at once if the objection were started that novel-writing ought not to succeed,—that it was a waste of life, and an enervating element in society: the truth or falsehood of the view would be of the last importance, but it would belong to the region of criticism and morals, not of science. And that is precisely what we fear may be increasingly felt in regard to the Art Section. It is not that the subjects with which it deals are not of the highest interest, and nearly the highest importance, but that they do not admit of discussion on the same grounds as the subjects included in the other sections. The question, however, is one of method. We are only too glad to see some of the subjects connected with artistic culture occupying a larger place in the attention of the Congress; and if it be found eventually that the number of subjects connected with art which come legitimately under the programme of the association is limited, it would probably be found that those which have the most really practical bearing on social science could be suitably considered under the head of education.

In the meantime we may say that the subjects chosen for consideration in the present instance afford, in the case of two of them at least, scope for a good deal of really practical discussion. The second leading subject named—"Are Art-competitions favourable to Art-progress?" seems to present less fruitful ground for discussion; the area of possible difference on the subject seems somewhat restricted, and the grounds for coming to any decided conclusions, as it appears to us, are rather insufficient. However, this may be one reason why the question should be considered, with the possible result of bringing it to a more definite issue. The first question on the paper, "What principles should govern the restoration of ancient buildings?" admits of a great deal of practical treatment, and the preservation of our great architectural memorials, as a part of our history, ought to be of serious interest to all educated people; and as the discussion of the subject has been, as we may say, a good deal artificially stimulated of late, there is a good opportunity here for some of those who have had most experience in restoration to give their views and the result of their experience, as against the somewhat overdone attacks of the newly-formed anti-restoration party. We expect that some of

those who could, if they would, speak from practical knowledge of the difficulties of restoring, those who are moderate and in the main conservative men, and do not unconditionally unfurl the restorer's banner, have something to say on the matter which ought to have considerable weight with those who are not determined to see ignorance, carelessness, or vandalism in every repair or re-decoration of an ancient building. Only we venture to suggest that the subject should be treated apart not only from personality, of which there has been too much, but apart also from party feeling, and simply on the ground of common sense, and of consideration alike for the sentiment of the past and for the needs of the present.

The third subject announced in the Art Section, "How can Art be best introduced into the Houses of Persons of Limited Income?" appears to us to be by far the most important and interesting of the three, and the one, moreover, which is most capable of leading to practical conclusions; one, indeed, which could hardly be discussed by people of sense and education without their throwing out ideas worthy of attention by all who are interested in rendering life more gracious and beautiful in its conditions. There is, indeed, the same complaint of vagueness which may be made against the wording,—against the use of the "ambiguous middle term," which is called "art." "What do you mean when you talk of introducing art into people's homes?" would be a perfectly legitimate question, certainly, and the answer to it would radically affect the answer to the main question, Do you mean enabling them to get good pictorial works of whatever kind in an economical way; or enabling them to furnish their houses artistically and effectively at a low rate; or cultivating in them the taste which would lead them to wish to do all this and to learn how to do it? Any or all of these might be the line intended by the question, and all, perhaps, will be touched upon. But while pointing out that the word "art" as used here is necessarily somewhat vague, we are not complaining against the form of the question on that account; for we must have some of these convenient shorthand expressions which have the advantage of packing up a great deal of meaning in a small space, even though leaving a considerable latitude of interpretation; and the question is one which it cannot but be well to discuss, whatever shade of meaning is given to it. The most important, and hitherto the most neglected, subject in regard to art as affecting society is the consideration, how that which gives its charm to life, and renders it ornamental and enjoyable in the fullest degree, is to be made something more than an appanage of wealth; is to be brought within the reach of those who live in small houses and cottages, in its essentials, at all events, if not in its accidental and superfluous forms. What forms of the higher arts are there which have most of the spirit of art, most of its intellectual element, with least of its merely material costliness? How can art of this class be made cheap without being commonplace and mediocre? For, of all things in the world, mediocre art is the most entirely useless and worthless; a pretence, where the outside show of being something exists only, and the essence and spirit are absent. Then there is the consideration how the element of good artistic effect, in regard to form and colour, can be realised in the furnishing and decoration of houses without a prohibitory rate of expenditure,—a subject in regard to which some correspondence has taken place in our columns within the last few weeks. In regard to details, there is much to be looked into before arriving at any certain conclusion on this point; details as to cost of materials and processes, and their durability, permanence, and effectiveness; on all which we hope to get some information from those who will take part in the discussion of the question at Aberdeen. In regard to principle, the matter seems to us capable of being reduced into a narrow compass. It is in the main a question of good, truthful, and expressive workmanship. Let any article of furniture be made in the best and most common sense manner, in regard both to the purpose it is to serve and the material of which it is to be composed, and let any ornamental treatment given to it be such as to fall in with and emphasise that purpose and the qualities of that material, and such treatment, however simple and inexpensive, can hardly fail to be in the best sense artistic. How this aim is to be realised is one of the points on which we hope to get some further suggestions from those who will discuss it at the Aberdeen Congress.

THE PARIS CLUB OF MASONS AND THE FRENCH ARCHITECTS.

AN attempt to improve the moral and intellectual condition of the French workman has been attended, it would seem, with a comparatively large measure of success; and amongst those who have offered encouragement to the more zealous artisans the architects of Paris are conspicuous. The Club of Masons and Stonecutters, lately referred to in our pages, is actively engaged in a work no less important than the education of its members, and, in fact, of their *confrères* generally. It offers this year—1877-78—its third annual competition which is open to all *appareilleurs* and *tailleurs de pierre* of French nationality who are less than forty years old. The programme consists of six questions, each of which is explained by a diagram; these questions relate to circular vaulting, to arched openings penetrating a barrel-vault, to a lantern dome, and so on. The competitors are invited to make drawings showing the shape, size, and jointing of the different stones necessary to compose the bits of construction to which the questions refer; or they may make plaster models. In the latter case at least half the pieces of which the model consists must be loose, or fit to undo and refix. The drawings or models are to be delivered at the office of the club on the 16th of February, 1878, and a public exhibition of them will be held from the 21st to the 25th of February. A jury composed of the Comte de Cardaillac, and M. Bailly, architect, both members of the French Institute; of M. Eugène Millet, the worthy successor of M. Viollet-le-Duc in the post of Inspector-General of Diocesan Edifices; of other architects; of well known contractors, and of the President of the Society of Master-masons. The prizes, which are to be distributed on Sunday, the 28th of April, next year, will consist of two premiums of 800 francs and 300 francs; of an "honourable mention" substantially backed with 100 francs; and of several medals in bronze and silver. The works of the successful competitors are to be exhibited at the forthcoming International Exhibition, which is to make Paris once more the envied centre of attraction for the philosopher, the critic, and the tourist.

We not only offer our sincere congratulations to the masons of France in general, and to the members of the Masons' Club in particular, for the practical and business-like character of the programme of their third competition, but we further congratulate them for the inauguration of a course of instruction, entirely gratuitous, and consisting of (1) "primary instruction," (2) practical geometry, (3) linear drawing and "*coupe de pierre*." The course, which is to begin on the 1st of October next, will continue until the 15th of April, 1878, when prizes will be distributed to the deserving. The third section is to include the execution of plaster models; and the professor is a working foreman,—an "appareilleur." His branch of masonry is perhaps one in which the modern French excel theoretically, and which French architects, notably Philibert de l'Orme, have reduced to a science. The custom during the last thirty years of using soft stone and cutting all the mouldings after the stones are put together, has undoubtedly induced a little carelessness—a little disregard of geometrical rule in the shaping and jointing of stone walls, even in French public works. Where, as at St. Germain, under the direct orders of M. Millet, the stones have been moulded and sometimes even sculptured before they were fixed, the masonry has been carefully and scientifically executed; but we think even the most French of Frenchmen will admit that their masons have depended more upon the abundance of native stone, and the excellence of plaster in the neighbourhood of Paris, than upon those "subtle inventions" which Philibert de l'Orme left to an ungrateful posterity, or which the learned Rondelet approved. In England, where stone is scarce and dear, a great deal of respect is still paid to it; and we are convinced that the science and economy exhibited in the stonework of the New Law Courts would satisfy even M. Viollet-le-Duc that, if little is said academically, or perhaps understood, in this country of the "*coupe de pierre*," the application of geometrical laws is here practically in force, even though it be sometimes applied in what is irreverently called a "rule of thumb" fashion.

In a recent article upon "The Masons of Paris" we perhaps led those of our readers who are not closely acquainted with French work and workmen to confound the *maçon* with the English mason. Among our neighbours masonry includes all construction composed of stone or rubble, of brick, mortar, or plaster. The ordinary *maçon* builds a brick wall, fills in a wooden partition, or he plasters both; he imitates brick on a plaster surface, and runs a cornice inside or outside a house, with equal ability and indifference. He makes and lays *béton* or concrete; builds an ordinary stone wall; carries and hoists freestone, rubble, brick, or mortar; raises or puts together common scaffolding. The foreman of the *maçons*, called the master-companion, is the recognised superior of all the workmen of all trades engaged upon a building. Over the larger part of France the *maçon* is as common as the bricklayer is over the larger part of England; a great deal of brickwork of the more difficult kind has been done in Normandy, and even in Paris, by Englishmen, simply because there was only the mason to do it; and his notions, both of Flemish and English bond, were obviously of a crude character. In France, external walls are now generally composed of soft limestone blocks embracing the entire thickness of the wall; and party-walls are of small cubes of freestone, squared and dressed roughly, and laid often in plaster. Brick is sometimes used in the chimney flues, and the chimney shaft above the roof is often entirely of brick. But the *briqueteur* is, like his name, often an importation. In fact, the best brick buildings executed in the south of France during the Middle Ages are to be found in the neighbourhood of Toulouse and of the Agenais, not far from the original province of Limousin, whence the common kind of *maçon* has acquired his name, though in these days not always by right of birth. Not that the division of labour amongst workmen is less in France than in England; on the contrary, it is much greater, for in the first-named country the general contractor,—the farmer of petty tradesmen, and capitalist-employer of labour,—is almost, if not entirely, unknown. There the uninterrupted use of stone as the chief constructive material has preserved to the *maçon* his pre-eminence in the building fraternity, and the original nomenclature has been handed down to the present day. In the Book of Etienne Boileau (thirteenth century), the *maçons* and *tailleurs de pierre* are mentioned together, and defined differently, or rather with the distinction which now marks their labours and duties. In the larger part of England the comparative scarcity of stone, and the employment, for two hundred years at least, of brick as the chief constructive material, have caused the stone-cutter to be not only a specialist, but also a luxurious adjunct of the building trade.

The designation of the different workmen employed by the contractor of *maçonnerie* is very varied, and the pay of each is determined by the nature of the duties performed. The rough walling and other ordinary work is done by the "limousin" whose wages amount to hardly a franc a day more than the assistant, or, in Mediæval phrase, the apprentice of the "maçon." The last-named receives almost as much as the stone-cutter; he is hardly ever to be met without his assistant, who fetches, mixes, and hands him his plaster, and who keeps him supplied with *moëllons* or bricks, as the case may be. The "tailleurs de pierre" are simply the cutters or rough moulders of freestone, that is of *pierre de taille*, both hard and soft. They seldom mount the ladders; they remain under cover or in the open yard of a building in course of erection. These men prepare the blocks after they have been sawn into a convenient and necessary size or height of course; they square the edges, knock off the soft and perishing excrescences, smooth the face which is to be seen in elevation, dress the beds, and rough out the moulded profiles where directed. Only when the stone is exceptionally hard are the mouldings finished before fixing; with soft stone like that used in Paris, the mouldings are cut after the façade is put together. Such mouldings are consequently intrusted to a superior description of workman, called a "ravaleur," partly because he reveals out of half meaningless forms what the architect intended to express; and the work of cutting the different mouldings and ornaments upon the face of a wall is called the *ravalement*—the carved or sculptured portions being reserved for the eventual chisel of an artist who justly arrogates to himself the title of sculptor.

When a block leaves the cutter's hands it is generally carried on a two-wheel cart by a coterie of men and youths called "bardeurs," and it is raised to the required level by a crab, or

some more recent engine of the kind. It is then taken in charge by the "poseur," who is assisted by a "contre-poseur." Two other workmen, the "pinceur" and the "ficheur," are close at hand—the one wielding an iron lever, the other a metal blade with a jagged, toothed edge—who assist respectively in rolling the block along the rising wall, and in spreading mortar or plaster between the joints. Over all these men, who cut, carry, raise, fix, joint, and ultimately mould freestone, there is a foreman, who draws, under the direction of the architect, the several constructive details to their real size either on a plastered wall or an upright surface of planks, and who prepares the templets, which are usually made of laths, although lately zinc has been sometimes employed. This man, intrusted with what is called the *tracé d'appareil* and the *coupe de pierre*, is the "appareilleur." He and the master-companion are the two most important officials engaged upon a French building, and they are inferior only to the inspector or clerk of the works, who is generally a young architect. We refer, of course, only to large works, for in ordinary Paris houses a clerk of the works is rarely seen. There, the master-companion and the *appareilleur* take their orders usually direct from the architect or from one of his more advanced pupils.

The Paris Club of Masons and Stonecutters was founded in 1867, and nine years after, on March 31st, 1876, it was officially recognised as of "public utility." The Paris architects, who of late have distributed medals to the most meritorious pupils in various art schools, have also reserved for the workmen of the above club a silver and a bronze pro-medal (*jeton medaille*). The first medals of the kind given by the Société Centrale des Architectes seem to have been awarded to the Club of Masons and Stonecutters, although the carpenters have been since equally honoured with similar marks of recognition. A report of the "Jury des Récompenses" to be accorded this year to "private architecture" has been prepared by M. Charles Lucas, the energetic secretary-editor of the society. In it we find that since the Congress of French Architects, in 1875, the École des Beaux Arts has been enriched with a prize given by the Society, and called "Prix de la Société Centrale des Architectes"; a prize is also given to the pupil of the École Nationale de Dessin et de Mathematiques who has there carried off, the preceding year, the chief prize for ornamental composition. This year the medals reserved for the Club of Masons are presented, one to M. Auguste Leroy, a stone-cutter, at Boulogne, near Paris; the other to M. J. Capdevielle, who is also a stone-cutter. The former was one of the winners in the competition for the *coupe de pierres*, 1876–77; the latter was a prize-holder in the course of practical geometry presided over by M. Colson. The recognitions for meritorious work done by contractors, master-companions, and workmen, and now given annually by the Central Society of Architects, are this year reserved for remarkable efforts in wood-carpentry; and we use the compound advisedly, for the French have their "*charpente en fer*" as well as their "*charpente en bois*." Consequently, the scaffolding erected twelve months ago for the completion of the cast-iron *flèche* at Rouen Cathedral has been deemed worthy of signal tribute; an open-timbered roof in the style of the fourteenth century, executed from the designs of M. Juste Lisch, a Paris architect, at the chapel of the Dames du Sacré-Cœur, has also been characterised as remarkable; while M. Abadie has asked his brethren to reward the zeal and devotion, the "incontestable honorability," of the contractor of masonry at Perigueux Cathedral. The result is, that the Central Society has presented a silver medal to M. Filleul, a master-smith, and M. Gambier, a master-carpenter, both of Rouen, and a bronze medal to M. Gambier's chief workman; while two contractors of carpentry in Paris and M. Jean Laurent, of Perigueux, have received each a silver medal. The rewards given for "private architecture" are obviously not confined to workmen and contractors. The medal of the Society was given this year to M. Jules Hénard, and in the second place to M. Henri Parent, the architect of several modern *hôtels*,—that is, private mansions. A medal is also given to a provincial architect, and this year M. Joseph Letz has carried it off.

It appears that this excellent Society, which was founded in 1840, elects a jury or committee of members, consisting of the most distinguished architects in France, who visit houses and private buildings recently erected; and who report thereon to the general body. Hence the award of prizes. Whether the insular notion of rewards and punishments, in the shape of medals, entirely tallies with that in vogue among our neighbours it is needless here to mention. The Royal Institute of British Architects gives one big gold medal, with the sanction of the Queen, to a man of eminence who has made a name for himself,—and often a comparative fortune also,—to whom such a recognition is indubitably an honour, but only an honour. The French architects, on the other hand, appoint a committee of their superiors, all of whom are worthy to receive such a recompense as that given by the Queen,—and one of whom has received it,—to go into the highways and byeways of Paris and France seeking out the meritorious works of comparatively unrecognised talent. The present of a medal, however petty, by such men as MM. Lesueur, Bailly, Duc, or Lefuel to a struggling professional man is not only a compliment; it raises him in public estimation, or presents him to public notice. *Bis dat qui cito dat.* Honours are doubly welcome when they come unexpectedly; and they are usually most appreciated in the morning of professional or working life. We commend some of the proceedings of the Central Society to the attention of its British contemporary, more particularly with regard to the recognitions of merit, apparently acceptable, and to the relations, apparently cordial, of French architects and French workmen.

MUSIC IN ARCHITECTURE.*

THE course which we have laid out for proceeding to the elucidation of music in architecture requires us now to attend with some circumstantiality to the causes and characteristics of pitch in the music of sound. If the exposition may appear to make excursions occasionally a little to the right or left of the most direct route, it may be understood that this is for the sake of securing attention to what is most to our special purpose, by setting curiosity at rest on collateral questions that inevitably intrude themselves; it has been due in no slight degree to these confusing annoyances in flank not being duly provided against, that the main attack on the subject has hitherto so egregiously failed.

There are two kinds of instruments,—the monochord of ancient and the siren of comparatively recent invention, which give the means of computing the absolute or the relative frequency of the vibrations of the air which produce musical notes, and these contrivances accurately confirm each other. The monochord is the simpler contrivance, and supplies available introductory illustrations in a more convenient form. In its ordinary construction it is simply a single string or wire of uniform material and thickness, fastened at one end to a board, and then passed over two fixed bridges at any convenient interval, and kept at a uniform tension by means of a constant weight. The application of a straining weight is for the convenience of modifying the tension by the substitution of different weights of easily adjusted and compared proportions; otherwise, any string of a violin which is kept at a certain tension by the screw is equivalent to a monochord. When such a string is thrown into vibration by being drawn aside and released with a sufficient degree of force, it sets the air around in vibration, and produces a certain musical note,—its proper or fundamental note. The sustaining bridges are supported by or in contact with an adjacent elastic surface, which responds to and reinforces the vibrations that a perfectly rigid surface would only receive to deaden; and thus more air is set in motion, and a more audible sound produced, than would be due to the motion of the string alone and unassisted. Such a surface is supplied by a sounding-board, or a stretched parchment; the body of a violin is a combination for this purpose, of which the perfected construction is a masterpiece of ingenuity.

Under these fixed conditions of uniformity of the string or wire and degree of tension, the resulting vibrations are uniform in time, whether the excursions of the string on either side of its line of rest be greater or less; and when the rate is sufficiently rapid, they produce a musical note which is loudest at first when the excursions are largest, and gradually becomes less so till the string is at rest. If the vibration of the monochord is maintained, as by the continuous action of a fiddle-bow, the fundamental note may be prolonged for any time without change.

For purposes of experiment with the monochord, a movable fret is provided, by which the string may be stopped as by an intermediate bridge, at any point between the strained extremities and to the length of the vibrating string—of the portion of the full monochord which is thrown into vibration—may be varied as required.

This adjustment is equivalent to that which the violinist effects by touching a string with a finger at various points, and thus shortening its vibrating portions, and by altering the condition of length, producing a different musical note.

By experimentation then with various adjustments of the monochord, it is found, that as the length of the string is gradually shortened, a different musical note is produced with each change, and successively higher and higher in pitch, or more and more shrill; but that when it is shortened to precisely half its original length, a note is produced of higher pitch indeed, but recognisable by the ear, as the same as that of the full string. This result is best put to proof by providing two monochords exactly corresponding to each other, when on sounding the half string of one simultaneously with the full string of the other, the ear will appreciate the resulting musical note as unchanged. Let the shortened string be again reduced by half; that is, let it be reduced to one quarter the length of the full string, and again we have the identical note produced by its vibrations at again a higher pitch. This is a phenomenon of which the knowledge is due to experiment alone; apart from experiment, we should have no grounds for inferring *à priori*, that the note produced by a given full string would not differ as absolutely from that produced by its half as from others produced by its third or fifth.

It is upon this phenomenon that all the conditions of that musical scale, which has to be taken into consideration in the adjustment of musical harmony, is ultimately dependent; it will be observed how absolutely dependent are these conditions on the physical characteristics of elastic bodies, and of the air as the intermediary of audible sounds; and caution is most needful in transferring any but the most general analogies to impressions produced on other senses, as that of sight, by the agency of vibrations of a different medium having laws and characteristics of its own.

For the two monochords to possess the exact similarity which the experiment requires, they must agree in length, tension, and also in weight; the agreement in weight of two strings of similar material being measurable by comparison of transverse sectional areas, in fact, of their relative thickness.

The rapidity of vibration of a particular string of given tension and diameter,—or weight,—is in an inverse ratio to its length; the longer the string the slower will be the ratio of vibration; if it be shortened to one third, its rapidity will be trebled; if to one half, only the rate of vibration is doubled. In this latter case, as we have seen, the resulting musical note will be the first repetition of the original fundamental note at a higher pitch; and if the length of the string be doubled, the rate of vibration will be halved, and the first repetition of the original note at a graver pitch will be produced. Like changes may be induced by leaving the length of the string unaltered, and varying either its tension or thickness.

Increased tension produces more rapid vibration, and therefore a higher note; degrees of tension may be regulated or ascertained by comparison of stretching weights; and it is found that to double the rate of vibration we must quadruple the stretching weight;—to treble the rapidity we must increase this weight ninefold. That is to say, in general terms,—"Rapidities of vibration of strings which agree in other respects, compare in the proportion of the square roots of the tensions,—or of the stretching weights."

The length and tension of the string or wire may be left unaltered while the fundamental note will be affected by a change of thickness. Increase of thickness,—that is, of weight,—reduces rapidity of vibration; and here again the differences proceed proportionally. Assuming the string to be round, as circles are proportionate to each other as the squares of their diameters, the diameter of a string is the exponent of the square root of its weight; the law, therefore, may be stated thus:—"Rapidities of vibration are inversely proportional to the diameters,—

* See p. 776, *ante*.

that is, to the square roots of the weights, of the strings."

Thus to reduce the vibration to one third, the diameter of a given string must be trebled; and to halve the rapidity the diameter must be doubled.

Whether the weight of the string is increased by additional thickness of like material or by substitution or addition of material of different specific gravity, makes no difference in the law; and it holds in either case that "the rapidities of vibration of different chords which agree in length and tension are inversely proportionate to the square root of their densities."

There is no proof that the ancients availed themselves of the density of metal for their stringed instruments, either as wire or by strings enveloped in a coil of wire. Pope, in a beautiful translation of a beautiful passage, makes Homer say:—

> "As when some heavenly minstrel taught to sing
> High notes responsive to the trembling string,
> To some new strain when he adapts the lyre,
> Or the dumb lute refits with vocal wire,
> Relaxes, strains, and turns it to and fro,
> So the great master drew the mighty bow;"

but when we turn to the original, we find that the ancient bard was beholden specifically to the "gut of a sheep."

In antiquity the great name of Pythagoras was credited with the discovery of some certain proportionate relation between the notes of the musical scale and the weights of instruments which produced them; such is the ultimate gist of the story of how he observed a difference between the notes produced by hammers of different sizes striking on an anvil, and traced the proportionate differences to proportionate weights. The story would bear on the face of it the proof of being blundered in transmission,—it reaches us through channels of the veriest gossip,—even though the particular proportions which it pretends that the Samian sage identified, were not in every instance perversely erroneous. What we cannot reject as highly significant, what will only be underrated by those scientists who in the pride of progress forget the difficulty of beginnings, is the original reduction of the phenomena of sound to a standard of numerical computation. It would not be unfair to ascribe to the just sense of what such a discovery imported, very much of the strength of that conviction that all the phenomena of Nature, on earth and celestial, must ultimately be connected by a chain of proportions, which has stimulated and sustained, and it may be added rewarded both speculation and research from the days of Pythagoras to our own. If, indeed, the philosopher thought a hecatomb no inadequate acknowledgment of thankfulness for a pregnant discovery in pure mathematics,—the equality of the square of the hypothenuse of a right-angled triangle to the squares of its other sides,—he might still more worthily, and even more enthusiastically, have bestowed another for the discovery which bridged over with security the momentous interval between the empirical and the absolute. Such is the large scope of the principle, as we have it in a sentence of the Pythagorean Philolaus, that it is the function and privilege of harmonious adjustment to reduce the manifold to unity, and the diverse to agreement.

It was in the very nature of this discovery that its bearing should be as palpably significant in the direction of art as in the study of nature. We may leave aside,—at present, at any rate,—the controversy as to the progress of scientific instrumental music among the Greeks,—but the abundant and varied remains of Greek lyric poetry exemplifies the labour and art with which all the mysteries of rhythm, of proportionate combinations of time, were brought into strict numerical subjection. For the maxims of one art to be transferred to another has never seemed more natural than in the earlier ages of artistic development; something of the later Hellenic sense of the allegiance of architecture to laws which might be called those of rhythm or of music, but were laws of harmony at last, seems expressed in the antique legend, how the stones that formed the walls of Thebes fell into their places at the sound of the lyre of Amphion. There are some strong indications that the earlier Greek architects put especial reliance on the leading proportions of Pythagoras, before a spirit of more decided independence was encouraged by the sense that architecture had as good a right,—was bound by as strong an obligation as audible music, to originate harmonious combinations of its own, and with exclusive reference to its own conditions.

To follow, as we have elected to do, this earlier speculative course and process, we direct our attention to proportionate lengths of an equally tense homogeneous string as the most convenient exponents, in the first instance, of variety in pitch of musical notes.

Commencing with such a monochord, we may assume it to be shortened by successive degrees of the utmost conceivable minuteness, and put into vibration after every change of length, producing at each change a different note, until when the string should be shortened precisely by one half, the original note would be found to recur but at a higher pitch. If we proceed to shorten the string still further, it is clear that at every degree we shall make it just half one of the lengths that we have already passed, and shall, therefore, have only a repetition of a previous note; and so if we lengthen the string beyond its original extent, at each degree, we shall but have a graver repetition of a previous note.

It must be observed, therefore, that notes which differ in pitch and, whether or not, also in loudness and *timbre*, may nevertheless agree in another respect which we will call character. This is the quality in virtue of which a note is identified with all the repetitions, whether higher or graver, and distinguished from all intermediate notes, quite irrespective of other differences. In the supposed experiment, therefore, of the constantly shortened monochord, we should have produced, whatever its original length, a representative of every possible variety of character of musical note, any one of which is producible at a series of degrees higher or graver; while conversely, of course, no note whatever is producible, that would not therein have had its representative either at a higher pitch or a lower.

Convenience requires that some particular note in this multitudinous series should receive an accepted name, and thus become identifiable as a common point of departure and comparison; only so can music be put accurately on record, and only so have a chance of being executed in some accordance with the intention and original conception of the composer. The name C has been assigned to such a note; but in the course of time, and in the absence of any authoritative standard, and also of any scientific test, the name has been liable to shift its place on the scale, and what should have marked a point of departure has, in fact, itself moved on, and to this extent the standard, as between one period and another, has been vitiated. The invention of the siren renders it possible to determine with perfect accuracy the number of vibrations, within a given time, as a second, which produce a certain note, and the means also of producing a note by any given number of vibrations in a second. It has thus appeared that the sound which Handel intended to be performed in the counter-tenor scale, when he wrote C, about A.D. 1740, was produced, as appears by his tuning-fork, by 499½ vibrations in a second; but the Philharmonic concerts A.D. 1812–1842, represented it by the note answering to 518⅔, and the Italian Opera by 546. These changes, which must, to some extent, falsify the execution of earlier music, are all in one direction, towards a rise in pitch, the tendency is usually ascribed to the rivalry of singers striving to surpass each other in the highest notes; it may have been promoted sometimes by an important singer only anxious to accommodate the best notes of his individual voice.

Mr. Chappell states that the later works of Haydn, and those of Beethoven, were composed for a standard pitch approximate to 512. This number is the cube of 8, and it has the convenience that the lower octaves of the notes that it expresses may be carried down through as many expressions as may be required, without recourse to fractions. It appears that it might have been adopted in England but for serious interference with vested interests in stocks of instruments constructed for the higher standard.

What we have now immediately in view is the elucidation of the proportions between the notes of the musical scale; and from this point of view it is indifferent what note is taken as the standard; the proportions between the series of harmonising notes, or the conditions that produce them, will always be the same.

From what we have seen of the physical characteristics of musical notes, these consequences follow; the proportionate relation of a series of notes whether higher or lower in pitch, to a note which is the fixed departure for comparison, may be expressed in terms of:—

1. The absolute vibrations within a given limit of time that produce the compared notes.

2. The proportions of the vibrations which produce the several notes to those which produce the standard note; it is matter of convenience whether these ratios shall be written down in their lowest terms, or, as fractions reduced to a common denominator,—the denominator being the equivalent of the standard or key-note of series.

3. The proportions of the lengths of the monochord producing the several notes to the full undiminished lengths, proportions which may either be expressed numerically or exhibited on a scale as the marked divisions of a given line.

As the lengths of strings which produce particular notes are in inverse proportion to their vibrations, the terms of the ratio for a given note would, as between such cases, be exactly reversed. Thus, in the case of a recurrent note at a higher pitch, the ratio of the doubled vibrations would stand as 2 : 1 or $\frac{2}{1}$, and that of the halved string which produces them as 1 : 2 or $\frac{1}{2}$; and so of any intermediate notes,—the ratio $\frac{4}{3}$ of the vibrations being equivalent to $\frac{4}{3}$ of the string; a string four-fifths only of the length of the full chord, would generate vibrations at the rate of five to four of those of the standard. There is a certain convenience in making use exclusively of the expressions in proportionate terms of vibrations; in consequence the denominator of a fraction will be understood in what follows, to represent in every case the assumed standard or key-note, and the numerator the compared note,—that is, the relative number—not the absolute number—of the vibrations that produce it. So the fraction or ratio $\frac{2}{1}$ represents a note which has two vibrations in the time of one of the standard note,—is its first recurrence at a higher pitch, $\frac{4}{1}$ being its second recurrence still higher, having four vibrations in the same time.

According to this scheme, whenever the numerator of a fraction which represents a note is the higher number, the note which is expressed by the ratio, is more acute than the standard note; and, on the other hand, when the numerator is a lesser number, the note is more grave; thus, $\frac{1}{2}$ represents the first graver recurrence of the standard note, and $\frac{1}{4}$ the next.

The following series represents the ratios of the musical notes of the major and minor scale:

$$\frac{1}{1}\ \frac{9}{8}\ \frac{5}{4}\ \frac{4}{3}\ \frac{3}{2}\ \frac{5}{3}\ \frac{15}{8}\ \frac{2}{1}\ \frac{9}{4}\ \frac{5}{2}\ \frac{12}{5}\ \frac{4}{1}$$

The denominators of these fractions represent so many vibrations of those producing the standard note which occur within the time occupied by those expressed by the respective numerators; and each fraction thus represents a note, which harmonises agreeably when heard along with, or in sequence with, the standard note.

It is obvious, on simple inspection, that this series of ratios is a very limited selection from the list of those which might be interposed between its extremes of $\frac{1}{1}$, or equality, and $\frac{2}{1}$. It is, above all, the principle of this selection which we have to set forth and account for; thus only can we vindicate our warning for the music of sound to respect its proper boundaries, and not claim to control the laws of proportion in the music of architecture.

Wentworth.—The Archbishop of York has consecrated the new church at Wentworth, which has been erected by Earl Fitzwilliam in memory of his parents. The building is Early English in style, and consists of nave north and south aisles, two transepts, chancel, and vestry. The total length of the church, outside measurement, is 130 ft., the chancel being about 25 ft. long, the transepts about 20 ft. across, and the nave about 80 ft. long. The width of the nave, including the aisles, is 46 ft. inside, the outside measurement being 53 ft. The space between the chancel and the nave is lighted by means of a lantern tower, the top of which is 100 ft. from the surface of the ground. Over this is the spire, reaching to a height of 198 ft. from the surface of the ground. The edifice is built of Darfield and Hooton Roberts stone, the pews and all the woodwork being of English oak. It will accommodate about 550 worshippers, all the seats being on the ground-floor. With the exception of the portion covered by the pews, the floor has been laid with Roman Mosaic paving, which has been supplied by Messrs. Burke & Co., of London. The architect of the church is Mr. J. L. Pearson, A.R.A., of 46, Harley-street, London; the contractor being Mr. G. W. Booth, of London and Gosport. The cost is stated to be 25,000*l*.

LOCAL MUSEUMS, AND THEIR VALUE.

THE DOVER MUSEUM.

THERE are many things, not unfrequently touched on here, and urged on the attention of those who are most interested, which are still year after year suffered to remain in their but too commonly imperfect state,—things that might be made to serve most useful ends, but yet do so very little for us. Of this multitude of things, not one of the least important and interesting is that of local museums, *i.e.*, of museums devoted to the acquisition and orderly arrangement of objects special and peculiar to the locality in and around which they are produced and collected. A visit, for however short a time, to any one almost of our sea-side towns especially,—of course not forgetting inland ones,—will but too soon convince any one of the importance of this; not only from the fact of what such collections do contain and do not contain, but from their very meanness, and from the notable absence in them of so many things which such institutions ought in fairness to contain to make them illustrative of the precise locality wherein they are situated. It may, at this season of the year, be of some little interest, as all the world who can by possibility do so go to see other localities than their own, and get to feel an interest in them, and a wish to know a something more about them than is to be got at through an ordinary guide-book. We would, in illustration, here refer to one or two well-known provincial localities, world-famous ones too, and of ancient interest, and wherein attempts have been made, as it is, to form local museums and collections of the objects, both natural and artistic, which they have made in the past or do now in the present day produce. We confine ourselves at present to matters antiquarian and artistic.

We might take for example such a town as Dover, famous and noteworthy in very many ways. Dover was a Roman station, and before that "long time ago" it was a primeval British one,—Dwr. Saxons and Normans have each in turn held possession of it, and each have left more or less striking memorials of their occupation. The Cæsar himself was tempted, we are told, by the sight of Dover cliffs to cross the sea, and to look at our island for himself. Right notable, therefore, is it, and, as might be supposed, it contains even yet not a few things indicative of the successive races of men who have occupied it, and built each in its own way upon it. We can but imagine the rude men, with their manufacturing and artistic capabilities and their building contrivances, whom Cæsar first met on his landing here, or very near to the present town of Dover. But it may be of interest to note that in the Dover Museum collection, imperfect as it is, there is a very interesting collection of savage objects of art and contrivances [from New Zealand and other South Sea Islands. These are not ancient "British," it is true; but the savage man, as Humboldt has remarked, is much the same in many ways all the world over, and his same rough ways and contrivances are to be found north and south. The details differ, in a wonderful manner, too, sometimes; but the way of work is the same, or nearly so. Thus, as we venture to think, in the absence of any genuine British antiquities, and ways of doing things, these contrivances and rude artistic work from New Zealand are not inappropriate here. But, we would ask, could not an effort be made to get together a more or less complete collection of the arts of the British man, who, once on a time, though so long ago, here held undisputed empire?

Now Dover has the *beginnings* of a museum,—a sufficiently miscellaneous one. There are all kinds of things and curiosities in it besides this series of curiosities and war-clubs, and paddles, and fragments of dresses, and "ornaments" from New Zealand, and from other places in the South Seas. They are, as such now out-of-the-way things always are wherever found, of much interest. And then there is a zoological collection of a very miscellaneous character, and of course in so small a space, very imperfect indeed; a collection of stuffed birds; and then again a number of cases filled with a miscellaneous collection of minerals and geological treasures; and then, what will perhaps most interest the readers of an art journal, a collection, and a very small one, of *antiquities* and *architecture*. And here it is that we may perchance throw in a word that may be useful should any attempt ever be made to render this museum one more strictly typical and *locally* interesting. Dover, as we said, is so notable and historic a spot, that it would seem as though no pains could well be thrown away in the effort to collect as many special records of it as possible, and that we should spare no pains to collect together as much and as many fragments of its past as can be done. Many inhabitants of such a town, it will be found, have in private possession not a few odd fragments of its *past*, which, though but mere curiosities when seen on a mantel-piece, would be of great importance and interest if brought together and catalogued, and described according to date and precise locality. We have seen a few of these, and been a little surprised at the small amount of interest taken in them until their historic value was pointed out. Much might thus be acquired.

And there are, as it is, in this collection, and to it we more especially refer, a few fragments and examples of the past Gothic architecture and sculpture. True, they are very few in number, and not being catalogued or labelled in any way, we can but make guess here and there at them. There is a Perpendicular cap on the ground, so that it is difficult to see it; and there are some three or four small figures, and some odd fragments picked up here and there, as we must suppose, by accident. But there is one noteworthy example: a sepulchral slab from some neighbouring church. It is one of those few memorials yet left, in original state, of the Crusaders, and of which the London Temple Church contains so many. This is a stone slab, with the cross and long-pointed shield in relief. It is simple enough, but is admirably cut, and striking from its very simplicity. It would, we think, be better if on the *floor* of the museum than where it now is, and might, we cannot help thinking, be added to, if diligent search were made. And might not a notable collection of such memorials of the Norman occupation here be made, by adding *casts* of those yet to be found near at hand? There is, indeed, no more instructive or interesting work to be found in broad England than is that of the Normans during their occupation of the country. A great race of architects they were, it is certain, and nothing more impressive has been done here in England than what they did. Much more might be said here, and with the remains of the magnificently-placed castle and keep close by, and which form so striking a picture when seen from the sea, no pains would seem to be too great to help to further knowledge of the race who could do such notable things.

There would seem to be hardly a doubt that a most interesting and instructive collection of the *local* antiquities of such towns as Dover might be formed, and would in time prove attractive to visitors, and certainly to artists and lovers of historic antiquities. First, a collection of the special materials, either produced on the spot or specially *imported* into it, and for its own use. And, then, as many examples of the *uses* to which such materials have been put in past days, and as showing how they have been moulded into form, and as showing how those forms have changed as time, and art, and manners changed. We are here confining ourselves to our own special side of such local museum,—to materials, and to forms in materials,—to architecture and sculpture, and antiquities,—and cannot but think that some novelty even in these days of museums and exhibitions would be found in the very fact of confining these collections to the localities themselves, and without attempting too wide fields of action. People might be supposed to go to a town like Dover,—to cite that by way of special example,—to look into *its* special history, and antiquities, and past modes of work. Antique Britons, rude and savage as they were, are worth the knowing a something about. After them the Romans, world-conquerors, found out England, and left "memorials" enough, even here; then Saxons, and Normans, and then the great Gothic ages,—down to the present day. But a few examples of each of these art efforts might be got together from, in, and about the town itself, and might and would usefully exemplify the successive phases through which art and architecture have *locally*, as well as generally, passed. Much, it is true, has already been done in this way here and there, but it is as nothing to what might be done. And in thus speaking specially of a museum of Dover antiquities, we must not be understood as meaning to confine them alone to the mere fragments to be found and seen on tables, and in the glass cases in a museum-room, but to include those larger and more impressive examples to be found here and there in its antique castle itself and in its churches and elsewhere. The Normans were adepts, indeed, in architecture, in castle and church building, and if the word "picturesque" applies well to a building *per se*, it certainly does so to a Norman castle. As here to be seen overlooking Dover town, nothing can be imagined better placed, or still more happily chosen! It grows out of the hill on which it stands naturally, and gets more and more impressive as you get nearer and closer to it. A right true and keen perception of the sublime in architecture, and in the grouping of its parts, had the Norman architects, and the idea of it gradually grows till the massive "keep" itself, surrounded by towers and walling, is reached. The good town of Dover has reason to be proud of its tower, even in its present somewhat unhappy state of repair, poor enough as the work indeed is, patched and smoothed over every here and there, whole square yards of it, with common cement, marked to look like stone! It is truly but a poor ghost of its former self, and with all sorts of falsities in and about it, so much of the original work having disappeared. It is in part utilised as a military storehouse. We might ask why so, for there are close to it whole lines of barrack buildings and storehouses far better suited for such a purpose. The antique unrestored "Pharos" is at present utilised as a coal-shed!

We have specially cited Dover by way of example, not by any means because action is needed there more than elsewhere, but because there would seem to be some just now peculiar facilities and opportunities for action. York might, too, be specially named; for that archi-episcopal city is right full of memorials, and, indeed, generally it would perhaps be impossible to name any one of the old towns of England, dating from the Conquest, and even further back than that, to which our remarks do not apply. Every locality is found to produce some special material, and to call forth some special modes of construction, and to induce some peculiar turns and phases of architecture and art, and certainly and always did so in times of yore, and before our modern systems of contract made all things and methods so much alike all the kingdom over. Much,—very much,—has been got and gained by facilities of travel, and by increase of trade and commerce, and by universality of knowledge and information; but a something, and a good deal, too, has been lost and sacrificed to it at the same time,—among much else, individuality of work, and human expression, and individuality of artistic thought and development. All things are getting alike everywhere, and what you see every day, and all day long, in the huge metropolis, comes in fragments to Dover and to multitudes of places like it. What is peculiar to each is lost sight of and falls out of use. The local power, artistically and otherwise, is all but lost in the all-potent machine-like movement going on everywhere. Much gain here, doubtless, but infinite loss, too!

THE FUTURE OF NEWCASTLE-UPON-TYNE.

NORTHERN ARCHITECTURAL ASSOCIATION.

THE opening meeting of the Northern Architectural Association for session 1877-78 was held on the 4th inst., in the Old Castle, Newcastle-upon-Tyne.

Mr. Thomas Oliver, the President, delivered an inaugural address, in the course of which he said:—I leave it to your imagination to fill up the particulars of the material development of the district, with its enlarged population, and the improved appliances for reducing disease and improving our atmosphere, that are likely to ensue when Newcastle shall become a city, with a cathedral church; when it shall possess its local university, a magnificent town-hall, a railway encircling nearly the whole of the new city and suburbs; when the Moor shall be studded with mansions, and the Leazes one great laid-out park; and when the suburbs of Newcastle shall be not only within easy access of the city, but be choice and picturesque, if not like Jesmond Dene, at least something approaching to it. Our ancient town is evidently in course of translation into a city. Few people outside appear to be aware that Newcastle is already a county of itself, as much as the county of Northumberland is a county of itself. Indeed, many of the older geographical school-books call it the capital of Northumberland; and even now letters by well-educated people are not in-

frequently addressed Newcastle-upon-Tyne, Northumberland. When legally entitled to the more dignified and euphonious name of city, we shall be asked for our cathedral. Shall it be St. Nicholas, or, like Manchester and Edinburgh, shall we aspire to a new and more befitting one? Wealthy as the district undoubtedly is, and noble and generous as many of the donators may be, I fear the strain would be too great to attempt to erect a new cathedral, and, almost simultaneously with it, a localised university. That now at Durham ought to have been in Newcastle. Something has been transferred, it is true; and a successful school of science has been established which may be looked upon as an embryo university—not necessarily a university such as Oxford or Cambridge, but such as exist in London and Edinburgh. Why should the youth of the present day have to live out of town—in another city, indeed—in order to be educated? Why cannot the professors come to them here? If a place be wanting, surely this would be forthcoming. We can get a site upon the Moor—the Moor must be had! The dual authority of the Corporation and the freeman can only terminate in one way. The municipality of the new city will demand this as an earnest to its progress and the pressing necessities of the case. For necessary it is, not only for occupation and building purposes, but also as a source of revenue to the heavily-taxed inhabitants of the borough. Quite towns are being built beyond our municipal boundaries, none of which add to our revenue in the form of rates and taxes, but all of which make use of our facilities and improvements. Would you build upon the Moor? I have been asked. Distinctly I say, Yes, I would. I would not build rows upon rows of houses, with front streets and back streets, and such like. I would have no back lanes whatever; they are a source of disease, crime, and immorality. I would build mansions to begin with, and with the money obtained for the sites I would make roads, and I would sink deep drains to purify the soil and carry off the foul water that either lodges in it or evaporates with the sun's heat into dangerous malaria. I would then make a few parks—not one, but a dozen; that is, I would suggest having large open spaces, all free to the public, and of course plant them with trees, shrubs, and flowers. There is plenty of land both for mansions and parks. But, in addition to these, I would build suitable dwellings for the working classes. These should be as near to the city as possible; and instead of being built at the rate of from thirty to fifty per acre, I should give them open places for playgrounds for their children, and for workplaces, as gardens, for the parents. The area of the Moor is about 1,100 acres, and, with the Leazes, these two cover about as much ground as the whole of Newcastle does. Is it not shameful waste? It is not unhealthy to build upon open spaces, provided you drain, build well, and do not overcrowd. London is very closely built in, yet the death-rate of London is not nearly so high as Newcastle. The Moor has been called the lungs of Newcastle. Yes, but these lungs are not perfectly healthy; they want better food to improve the blood, which is quite out of order. Now, this can only be done by having a properly levelled and channelled surface, capable of being drained and kept in good order by carrying off the surplus water in deep, underground conduits; and this can only be secured over so large an area by placing it in the hands of one responsible body, which body shall have power to dispose of portions of it for its own improvement. And in order to bring these and other extensions within easy access of the city, I propose that a new line of railway should be formed outside and almost encircling the city. Begin at the Picton Station, on the Blyth and Tyne branch, proceed to the Manors and Central Stations, then branch off at Elswick—and proceed by underground to Benticck—thence to Benwell, on to Fenham, traverse a portion of the Moor, and keeping within its skirt Coxlodge, Bulman village, and Gosforth, where, uniting with the Blyth and Tyne branch once more, you have a mode of communication nearly half made, and certainly very desirable. Tramways, of course, will become universal between given districts; and as noiseless engines are now in vogue, we ourselves may expect to see their introduction before many years. But, in addition, we ought to have more and better constructed omnibuses. Thus, with the above, and with the Cattle Market removed beyond the limits of the city, where abattoirs for slaughtering cattle would be erected, after the healthy and wholesome manner of the French; and with a new infirmary erected in a suitable and salubrious situation; and a new town hall, with its grand cupola or dome reaching to a height of 250 ft. in the air, removed from the huxtering of shops and barter, and dwarfing by its commanding size and proportions the beautiful Catholic Cathedral of St. Mary, as it stands on its magnificent site, now occupied as a cattle market. The new Courts of Justice—courts in keeping with the architecture and wealth of the city—will present themselves in Northumberland-street, and just as old houses are found useful when new ones are built and occupied, no doubt the old courts will prove valuable adjuncts to the increasing demands for large and well-ventilated buildings. The Free Library will be a feature in New Bridge-street, where, unfortunately, a lot of poor-looking buildings have lately been erected, which greatly intercept the fine view of a very effective architectural group of public buildings. And so with other works, not excluding the Leazes Park and Elswick Park. What Jesmond Dene will be time only can tell. It is perfectly charming now; it may hereafter realise our idea of the Champs Elysées. The improvements in our bridges, roads, and approaches are already very considerable; hereafter we may expect to see greater improvements still. The death-rate will then be considerably decreased, personal comfort will be greatly enhanced, facilities for locomotion will be enlarged, social habits and customs will be elevated, and the spiritual, intellectual, and physical condition of the community will be advanced. As architects, we shall have to take our share in the work to be performed, and I trust we shall be prepared to do it manfully.

The Honorary Secretary (Mr. W. H. Dunn) then read a letter from the trustee of Mr. David Bryce, architect, Edinburgh, who has been called upon by the trustee of Sir Wm. Fettes and the Bank of Scotland to deliver up the original plans, specification, and drawings of Fettes College and the Head Office of the Bank of Scotland. As the question of ownership of drawings is one of great importance to the profession, it was resolved to write to the trustee to arrange to have action delayed until the Royal Institute of British Architects had been consulted in the matter.

Mr. Thos. Prosser, in the name of the members of the Association, presented Mr. Oliver with a handsome gold watch, suitably inscribed, in appreciation of the valuable services rendered by him as honorary secretary to the Association during a period of twenty years. Mr. Prosser said it was to Mr. Oliver that they were indebted for the establishment of the Association, and it had been the cause of many kindred associations being established. The speaker referred to the benefits which the Association had conferred upon the profession, and said he was glad to know that it was progressing.

Mr. Oliver thanked the members for their handsome present, and said he should appreciate it for the remembrances and associations in connexion with it. He felt that it was an unmistakable token of his having the goodwill of his professional brethren, and that satisfied him above anything else.

The meeting considered the proposed building bye-laws for Newcastle, and approved of them, with a slight modification.

THE LLANGOLLEN CONGRESS OF THE BRITISH ARCHÆOLOGICAL ASSOCIATION.*

As already noted, the members of the British Archæological Association visited the remains of Cymmer Abbey on Friday, the 31st ult. Of Mr. Loftus Brock's paper we here give a fuller account. He said the long beautiful valley, hemmed in with lofty trees, more or less distant, indicated plainly that the ruins on its side were those of a Cistercian abbey. Leland ascribed the foundation to Llewelyn, Prince of North Wales, about the year 1200. The foundation was an offshoot of the Cwm Hir Abbey, in Radnorshire. The founder or founders, however, could not be conclusively determined. What was then known of the documents relating to the abbey was set forth in the "Monasticon," and in a capital article in the first volume of "Archæologia Cambrensis." The British Museum roll of Cistercian abbeys gave the date of foundation 1199. The known documents, the Cistercian roll, and the site, all agreed that this was a house of that order. Strange to say, the buildings alone, where they should expect to find clear evidence, did not agree in that respect. They could not trace there any of the usual arrangements of a Cistercian abbey. The ground plan of the church was all but perfect, and could quite be made out. Instead of the cruciform minster, with its transepted chapels and its central tower, they found there a continuous nave, a continuous north aisle, the anomaly of a western tower opening into the nave, and of the continuous north aisle opening into the church by arches only at the western extremity of the nave, and which was elsewhere entered only by openings (irregular) into the eastern part, walled off from the western. The south side of the church, how much ruined, so far as the nave was concerned, had some irregular openings, which led to apartments, of which there were no remains, outside the church. A roughly walled area, now an orchard, afforded space where they would seek for the conventual buildings, constructed as usual around the central cloister space; but in this area there were no traces of buildings anywhere. A small spring, open above and below, was carried partly underground along the south side of this space, and reappeared again in a plentiful fountain at the south-west angle. This must have always been a small house. At the Dissolution the revenues were only 58*l.* 15*s.* 4*d.*; but the quadrangular space south of the church, its usual position, appeared to indicate that the intention at least was to construct the buildings according to general rule, and which could be adapted as well to a small as to a large establishment. The anomaly of the western tower was so great that it would be of interest to state that it was almost the only example of such an arrangement known in Great Britain—excluding the western tower of Furness Abbey, since that was a late erection in place of and upon an earlier and towerless west front. The period of the erection was of interest, for it led them on in the history of the buildings. After a careful survey of the architectural features, he had come to the conclusion that none of the work now standing belonged to the original building, or at least of the date of the foundation, and he could detect no signs of reconstruction; also, that it was of one period, or nearly so. The whole agreed in style, and could not be ascribed to an earlier period than the end of the thirteenth, or beginning of the fourteenth century. The north aisle arches sprang from octagonal columns with plainly-moulded capitals and bases, while the arches had two plainly-chamfered orders. There had been a moulded label on the nave side. Sufficient traces of four clearstory windows remained to show that they were of two lights each. Above the three eastern lancets were three smaller ones, but they were hidden beneath the luxuriant ivy which now covered most of the ruins. The three lancets had the peculiarity there, as at Valle Crucis, of commencing at a level remarkably close to the paving, in proportion to the size of the church. The present earthen flooring represented pretty nearly the original level, and he did not believe that there was any considerable accumulation of earth within the building. Excavations were made a few years ago and no paving was found. The questions raised were so unusual, and the remains so interesting, that the Association had sanctioned the preparation of a carefully-executed ground plan, from a survey made expressly for this purpose. It was to be hoped that its appearance in their *Journal* would be of interest, and the more so since it had never yet been published in its entirety. The dimensions were as follow:—Total length from east to west (inside the walls), 118 ft. 3 in.; width of nave, 26 ft. 2 in.; width of north aisle, 17 ft. 1 in. The material was the slaty stone of the district, not too well built, with dressings of freestone. The large quantity of small square holes quite through the walls had often called for remark. They were certainly more numerous there than in any other building known to him, and from their going quite through the walls, they were arranged for some other purpose than mere "putlog holes." They were also too numerous and too closely connected to have answered this purpose. In explanation, if they supposed that all the windows of the church were fixtures, then they might assign at once a use for them,—the ventilation of the building.

After hearing Mr. Brock's paper, the party

* See pp. 903-906, *ante*.

adjourned to the so-called refectory of the abbot's house—a large hall with a timber roof and gallery on one side, near to the huge fireplace and its roomy chimney corners opposite to the western door of the abbey. Here Mr. W. W. E. Wynne and Mr. Bloxam made some interesting observations, Mr. Wynne narrating to the company that he and Miss Lloyd, then present, had some years before excavated the interior of the abbey in the hope of finding some gravestones or effigies, as had been so successfully done at Valle Crucis, but with no results at Cymmer, they only coming across a large number of bones; and Mr. Bloxam remarked that the plan of the abbey resembled that of the small Priory of Ulverscroft, in Leicestershire. He expressed the opinion that the building they were then in was no refectory at all of the abbey, but merely a hall of the seventeenth century. From this view, however, many dissented, as although parts of the hall were undoubtedly of that time, the remains of the other buildings around it indicated a much earlier period. After a thorough re-examination of the abbey, under the guidance of Mr. C. W. Talbot and Mr. John Reynolds, and a further explanation of the peculiarities of the building by the former gentlemen, the party walked back to Dolgelly.

Llandderfel Church, visited later in the day, was described by Mr. Brock, who said it was a simple Welsh village church on the site of another of very great antiquity. The greatest interest of the church was its connexion with St. Dervel. The statue of that saint was one of the most renowned in North Wales. It was held in high veneration in the sense in which Roman Catholics still used the word, and pilgrimages were made to it. Mr. Brock called attention to the great antiquity of the foundation of the church as indicative of a time when Christianity was more known in Wales than in England. On perambulating the outside of the church the party were much interested at some of the label terminations of the windows, which presented a very grotesque collection of ugly faces, both male and female, boldly carved in light yellow freestone, the stone of the country, and about the same date as the church. In the porch the visitors noticed the remains of the wooden horse upon which St. Derfel was said to have been once placed. This figure, as Mr. Breese related, was used at Smithfield to help to burn a priest for denying the king's supremacy in 1538, and thus was an old Welsh prophecy fulfilled, as the poor friar's name was Forrest, that "the Saint Derfel should set a whole forest on fire." Pennant says, quaintly enough, that he hopes this deed was done "to take away from the people the cause of idolatry," this image bringing in a large revenue to the church from the number of offerings made at its shrine. The "Spere" staff, or a portion of it, mentioned in some verses quoted by Pennant, still exists, and was pointed out by Mr. Breese, who remarked that there was little doubt of its date suiting the time of the legend.

An evening meeting was held in the Assembly-room at Llangollen, when the following papers were read and discussed, viz.:—"On the Arms of the Principality of Wales," by Mr. Stephen Tucker (*Rouge Croix*); "On the Ancient Laws and Statutes of Wales," by Mr. C. H. Compton; and "On the Welsh Converts of St. Paul," by Mr. J. W. Grover, C.E.

On Saturday, the 1st inst., there was an excursion to Denbigh and Ruthin. Arriving at Denbigh at 11·30, the visitors were met at the railway station by the Mayor (Mr. T. J. Williams), who escorted them round the town. Among the objects of interest inspected was the Burgess Gate-tower, an old military structure, with a fine archway, defended by two massive flanking towers or bastions, with spur buttresses. It is locally considered to be the only remaining town gate, and was formerly closed by a strong portcullis.

The visitors next proceeded to the ruins of Denbigh Castle, where Mr. J. Robinson pointed out to them the special points that were dangerous, and how it was intended to shore them up. He stated that the town and neighbourhood had subscribed and collected 600*l.*, which was to be expended, not in rebuilding, but in preserving the ruin. Those buttresses which were to support the overhanging parts were to be built of rubble, so that in a thousand years to come the supporting part might easily be distinguished from the real old ruin. Mr. Loftus Brock commended Mr. Robinson for his discretion, and trusted he would carry out the work in the spirit in which he had conceived it. He especially advised that the east corner of the noble front arch should be made secure. As to the entrance itself, he noticed that the groove of the portcullis was round, and not square, which was a very rare feature. The tower called the Peveril Tower of Dover Castle was like this, but not so good. The company then moved on to what is called the Kitchen, but upon its being really the "kitchen" some expressed their doubts. Mr. Brock said that there was no doubt that an older fortress stood on this site, and probably the tradition was right which ascribed the building of the castle to Lacy, Earl of Lincoln. To architects it was especially interesting from the worked stone so plentifully used at the grand entrance, and in other parts of the building. Much was recorded of the many towers in the castle, one of which overlooked that in which they were standing, though built in the valley beneath. This was the Goblin Tower. He thought that the green courtyard they saw must have had an intersecting wall, supported by towers, to account for the number. The architecture was of various dates; the building was altogether a good specimen of a strong castle, and he rejoiced at the efforts made by the people of Denbigh to keep it from falling down. It was curious that, notwithstanding the gallant defence it made on behalf of Charles I., his son ordered it and Carnarvon Castle to be dismantled. This was blasted by gunpowder, but Carnarvon yet remains. Mr. Robinson rather warmly criticised the Government of past days for keeping Carnarvon Castle in repair with public money, whilst they would not give a penny to preserve Denbigh for the people. By desire, Mr. J. Tom Burgess gave a brief account of the fortifications and general plan of the castle. He said that though he had only seen the castle that day, he dissented entirely from the idea that the gateway which bore his name (the Burgesses' Tower mentioned above) should be considered as belonging to the town wall. On looking round the fortifications he found that the castle, like many border castles and those constructed in a hostile country, was not only a fortress proper, but afforded defence for a much larger population than an ordinary garrison of the retainers of the lord of the castle. The Burgesses' Gate was the principal, and, indeed, the only entrance to the castle then visible, though possibly there were others on the basement story. A curtain wall extended from this gateway to two corner towers, from which walls could be traced to the outer wards of the castle proper. The space thus enclosed contained a church, St. Hilary's, and the large ruin they had seen. It was, in fact, the outer bailey of the castle. The stately entrance was a remarkable feature; it was, in fact, the keep—a building of great strength, and presented many features of military architecture of the period prior to the general introduction of machicolated parapets. The keep had a drawbridge, a portcullis, and inner gates, all commanded by the garrison. If these defences were taken the assailants would find themselves in a close space open to missiles of all descriptions, and a similar portcullis and gates before them. They would find that not only this but each of the towers was a complete fortress in itself, capable of making a separate defence, and probably held by some baron or knight of the Marches. Outside these were an outer guard or ward commanding the escarpment, and affording quarters for the purely military garrison outside the domestic offices.

As the company were examining the building usually called the chapel, of which only the walls remain, an old plan on Speed's map of Denbighshire was produced by Miss Gee, which singularly verified Mr. Burgess's statement. The party afterwards passed through the grounds of Castle House, the residence of Miss Fazakerly.

The ruin of Leicester's unfinished church excited deep interest. Mr. Brock said it was the remains of what would have been the largest and finest church founded after the Reformation; indeed, it was the first so founded. Robert, Earl of Leicester, though a man of great ambition, was a good friend to Denbigh, and he desired to remove the see of St. Asaph there. After passing through these grounds and visiting the Bloody Well in Goblin Tower, the party adjourned to the Assembly Room for luncheon, after which a few members found time to visit the desecrated remains of the Carmelite friary, known as the Abbey.

The party then proceeded by train to Ruthin, where they were met by the Mayor, who pointed out many of the quaint houses. The most interesting was one called "Plasnewydd," a low porched, half-timbered house, which gave little promise of the treasures inside. A balustered gallery runs round the central apartment, and the moulded beams of another show signs of the Tudor period. Hence to the Castle of Ruthin was but a few steps. At the castle the visitors were most courteously received by the Mayor, Dr. Jenkins, who conducted the party through the building and its grounds. The plan of this castle, founded in the reign of Edward I., differs in many respects from that of Denbigh. On the ruins a modern edifice, the seat of Mr. Cornwallis West, lord lieutenant of Denbighshire, has been erected. Mr. G. R. Wright read an account of the castle, which was chiefly remarkable for its siege in the Civil Wars by Colonel Mytton. After the Restoration it came into the hands of the Wests, Earls of Delawarr, to which family the present owner belongs. After going round the outside of the castle, the party sat down to tea, with fruit, served in the fine saloon of the castle, by Mr. West's butler. Mr. Tucker, on behalf of the strangers, returned thanks to Major and Mrs. West for their hospitality and kindness.

A special train conveyed the members back to Llangollen at half-past six. At the evening meeting, in addition to the conclusion of Mr. Compton's paper, there was also read "Notes on Early Monumental Sculpture," by Mr. C. Lynam.

Several members, instead of returning to Llangollen from Ruthin, proceeded to St. Asaph, and stayed there during Sunday.

Monday, the 3rd inst., was the last official day of the Congress, and the members left Llangollen in a heavy downpour of rain, by special train, *vid* Chester, to Mostyn Hall, whither they had been invited by Lord Mostyn. In the entrance-hall Lord Mostyn explained that he had been obliged to pull down and rebuild the oldest part of the house, which was of the sixteenth century, and was built early in the reign of Henry VI. He found that the greater part of it was built of clay without lime. The hall was a fac-simile of the old one, and the chimney-piece was modelled on the old chimney. The party were then conducted through the principal rooms of the house, and the large and most interesting collection of family and other portraits on the walls was described by his lordship. In the dining-room the date of the house (1632) is carved on the oak panelling over the fireplace. The books and manuscripts were described and commented on in a very lucid and interesting manner by Mr. W. de Gray Birch, of the British Museum. Before leaving the Hall Mr. Brock referred briefly to the architecture of the building, which he said was one of the most interesting old houses the Association had ever visited. It must be a gratification to all archæologists to find a house like that so admirably kept. He was glad to say that the modern portions, which had been rendered necessary from the lapse of time, were designed in a style so admirably and eloquently in accordance with the old parts. Their warmest thanks were due to Lord and Lady Mostyn for so kindly and courteously opening to them their hospitable house. Some refreshments were served to the visitors, who were obliged to decline a pressing invitation of Lord Mostyn to stay to a substantial luncheon which had been provided for them.

The party, after taking their leave of Lord and Lady Mostyn, left by train about two o'clock for Holywell Station, whence they proceeded in carriages to the celebrated well of St. Winifred, one of the "Wonders of Wales." There are many persons who still believe in the miraculous virtues of this holy well. The legend is thus told by the late Mr. Timbs:—

"In the seventh century lived a virgin of the name of Winifrede, of noble parents, her father, Thewith, being a rich noble, and second man in the kingdom of North Wales, next to the king. At a very early age she was placed under the care of her maternal uncle, Beuno, a holy man and a priest. Under his care she lived with certain other pious maidens, in a small nunnery, erected for her by her father, near the site where the spring now is. Having been seen by Caradoc, Prince of Wales, he was struck by her great beauty, and finding it impossible to gain her in marriage, he attempted to carry her off by force; she fled towards the church, pursued by the prince, who, on his overtaking her, in the madness of his rage, drew out his sabre and struck off her head. The severed head bounded down the hill, entered the church door, and rolled to the foot of the altar, where St. Beuno was officiating. Where the head rested, a spring of uncommon size burst forth—a fragrant moss adorned its sides; her blood spotted the stones, which, like the flowers of Adonis, annually commemorate the fact by assuming colours unknown to them at other times. St. Beuno took up the head, and, at his prayers and intercessions it was united to the body,—the virgin was restored to life, and lived in the odour of sanctity fifteen years afterwards."

On the visitors assembling in the chapel of

St. Winifred, Mr. Brock gave an interesting account of the sacred wells of Wales. He said that the holy wells of a country were interesting evidences of its antiquity. St. Winifred's Well was the most famous for its healing powers, and it was much more visited now than in Pennant's time. There was no record of it earlier than the intended visit of the Earl of Chester, but its antiquity was attested by its Saxon name. They might safely infer that it was one of the most ancient as well as the most famous of holy wells. The legend of St. Winifred had its origin in the seventh century. When he was there last, thirty-nine crutches and six sticks had been left behind by persons supposed to be cured. Mr. Brock then gave some details of the history and architecture of the chapel. The chapel is Late Perpendicular, with a very curious octangular apse. It is said to have been rebuilt by Margaret, mother of Henry VII.

After luncheon the archæologists paid a hurried visit to the interesting remains of the Cistercian Abbey of Basingwerk. Mr. Brock, in a brief description of them, said that it was greatly to be regretted that the owner, Sir Piers Mostyn, had allowed them to fall into such a state of neglect and decay. The party afterwards left by special train for Chester, and arrived at Llangollen about seven o'clock.

The closing meeting of the Congress was held in the evening in the Assembly-room, Mr. Thomas Morgan, F.S.A., hon. treasurer, in the chair. Mr. Dillon Croker read an historical paper on Harlech and Criccieth Castles, written by Mr. F. G. Westmacott Chapman, who traced the history of this famous fortress, beginning:—

> "In Arthur's days of ancient date,
> When Cambria's chief elected
> Her Maelgwyn to the regal seat,
> Were Harlech's towers erected."

But the present building belonged to the Edwardian period. In 1408 the castle was taken by Owen Glendower, and held for four years. Here Margaret of Anjou took up her quarters in the dark days of her misfortune. It was held for nine years by Dafydd ap Ijan ap Einion, who was at last obliged to surrender. The famous air, "The March of the Men of Harlech," dates from this period. It was also the last stronghold that held out for Charles I. Mr. de Gray Birch then gave a *resumé* of the work of the Congress, observing, in conclusion:—The British Archæological Association will depart conscious of having done its best for this year—the thirty-fourth of a vigorous existence—if it shall have taught you to *be still* and to hear the still small voice of bygone days which we, as archæologists, hear so plainly when we enter into the presence of the dead past; to see, as we see, the departed spirits of our ancestral sires; and to acknowledge reverently the superiority of those who have gone before us,—at least, as far as regards the lesson they have left to us, their posterity; and we may reiterate the words of an ancient poet, who so truly said:—

> "Ætas parentum pejor avis tulit
> Nos nequiores, mox daturos
> Progeniem vitiosiorem."

The customary votes of thanks were then warmly passed to the local gentlemen who had so kindly received the association, to the authors of the papers, and to the officers, after which Mr. J. Griffith expressed the pleasure which the visit of the association had afforded to his townspeople.

Thus ended the last meeting of the Congress proper.

On Tuesday, the 4th inst., a large number of the members of the Association went to Llangedwyn, at the invitation of Sir Watkin and Lady Williams Wynn. On reaching Llangedwyn they were heartily welcomed and hospitably entertained. Amongst the curiosities they inspected was a large golden torque, which was found on Cader Idris, and some tapestry of the seventeenth century. The visitors much admired the picturesqueness of the old-fashioned house, and the beauty of its surroundings. Just before leaving, Mr. G. R. Wright conveyed the thanks of the Association to Sir Watkin and Lady Williams Wynn for their courtesy and hospitality.

A section of the members, instead of going to Llangedwyn, explored the remains of Old Oswestry, and their proceedings are reported in the *Wrexham Advertiser*. During the brave resistance made by the Carnabii, the Silures, and the Ordovices, under Caractacus and Vennaius, the great camps which yet remain on the Salopian hills and the Welsh borders played a conspicuous part. Though it is almost impossible to identify any particular one of these, there can be no doubt that the oppidum known as Old Oswestry (little more than a mile north of the town) must have borne an important part. A slightly oval space of sixteen acres which crowns one of the low hills, billows of pebble and gravel, which here overlook the Cheshire Plains, has been entrenched, escarped, and defended by works of no slight strength or importance even when measured by such formidable earthworks as Old Sarum and those on the Herefordshire Beacon. By the kindness of Lord Harlech, this most interesting encampment, which, with its ditches and outworks, covers an area of nearly sixty acres, was not only thrown open to visitors, but the nettles and weeds which flourished in the ditches were cut down to permit a close inspection of the contour of the works. Those who took advantage of this opportunity were amply rewarded, for this great oppidum presents many peculiar features. The ramparts or valla are ranged in terraces round the hill, varying not only in number but in slope and depth, but in no instance are there less than three lines of rampart, and the others merge into these in a similar manner to those of the great encampment on the Herefordshire Beacon. Those on the western side are not only the most numerous, but they enclose a series of elliptical hollows, now partly filled with water. Eight of these are on the north side of the south-west entrance, and two on the south. They answer to the "slingers' pits" in the great stone entrenchments at Worle, near Weston-super-Mare, but cannot have been used for this purpose. From the great care taken to fortify this position they possibly may have been formed to contain the household treasures of the leaders of the Carnabii, on the frontier of whose territory Old Oswestry stands. The spring which supplied the camp with water is situated by the side of this entrance, and in close proximity to these singular hollows. Watt's Dyke is connected with the outer vallum on this side, and runs due south in the direction of Oswestry, near the lane, but it is lost at Maesbury, three miles off. The encampment at Porkington, known as Castell Brogyntyn, lies to the west and south-west. A low tumulus crowns the summit of a slight elevation skirting the old road to the camp. The Wrekin can be plainly seen on the south-east, marking the site of Uriconium, the city of the Carnabii or Cornavii, for the name is variously spelt. The grey and misty heights of Breidden, the "City of Robbers," is plainly visible on the south. On these slopes one of the Roman legions was cut to pieces, and the Roman power trembled for supremacy until Julius Agricola assumed the chief command.

Oswestry itself rewarded the ardent few who wandered through its spacious streets. Half-timbered houses, with well-designed gables and barge-boards, queer penthouse roofs springing from dumpy first-floors, and surmounted by curious dormer windows, spoke of old times and of a taste to preserve these memorials. The church has been recently restored by Mr. Street. The heavy-buttressed and picturesque tower, which was partially destroyed during the siege by the Parliamentarians, and restored in that vague Palladian style which prevailed in the reign of Charles II., was worth inspection, as were also the lych-gate and framed house adjoining.

On the return of the party to Llangollen in the evening, their visit was brought to a most agreeable termination by an admirable entertainment in the Assembly Rooms, for the benefit of the Llangollen Cottage Hospital. Mr. Theodore Martin took the chair, and readings were given by Mrs. Theodore Martin (Miss Helen Faucit) and Mr. Dillon Croker, the musical arrangements being in the hands of Professor Davies and Miss Jennie Davies. It is stated that after paying all expenses there was a surplus of upwards of 50*l.* to be given to the hospital funds.

We may add that a small temporary museum was open during the Congress, under the direction of Mr. George Wright, the hon. Congress secretary, curator, and librarian. A large collection would have been formed had a more suitable place been found for the purpose than the Assembly Room. Sir Watkin Wynn contributed a beautiful collection of silver plate, &c.; Mr. J. F. Edisbury, Wrexham, an interesting series of coins of all ages from the Roman period to Mediæval times. A series of old engravings, illustrating the progress of the art, was exhibited by Mr. Brock. Captain M. Taylor sent interesting specimens of Celtic date, found in the immediate district of Corwen, amongst which were several very curious bronze implements. Miss Smith, of London, contributed several Etruscan vessels; and Mr. Brock a series of ancient lamps of Greek and Roman date, &c. Mr. Cecil Brent, Mr. Burgess, and other gentlemen were also contributors to the museum.

OUR MATERIAL PROGRESS.

THE publication of the twenty-fourth "Statistical Abstract for the United Kingdom" presents us with a mass of valuable facts; and as it is accompanied with similar facts for fourteen previous years, it supplies us with a record of the material progress of the country for fifteen years. In addition to a table of the public and local expenditure, the national debt, the customs' tariff, &c., we have a statement of the exports and imports, the shipping, the prices and sales of corn, the acreage under crops, postal and banking statistics, vital facts, educational, pauper, and criminal returns, with a mass of railway, mineral, and other statistics. Some are given at great length, others are presented in a most condensed form, but a summary of the whole may be found interesting. It appears from the initial table that the public revenue last year attained its highest point for many years, the exchequer receipts being 78,565,036*l.*—equivalent to a payment of 2*l.* 7*s.* 6*d.* per head of the population of the United Kingdom. The gross expenditure for last year was close upon this amount, the proportionate sum per head being 2*l.* 7*s.* 2*d.* The total receipts derived from local taxation during last year were 45,533,815*l.* Without dealing with the details of either of these two items we may pass on to the income-tax schedules, which show that the amounts assessed on were under Schedule A, last year, 162,431,893*l.*; under Schedule B, 66,752,333*l.*; under Schedule C, 42,389,640*l.*; Schedule D has the largest sum, the value being 266,942,347*l.*, and that under Schedule E, 32,540,064*l.* — the total amount of the whole being over 571,000,000*l.* Coming to the interesting subject of imports and exports, we have first a proportionate statement, from which it appears that in 1876, the imports were at the rate of 11*l.* 6*s.* 8*d.* per head of the population, and the exports of British produce 6*l.* 1*s.* 3*d.* The table of exports and imports to various countries proves that our trade—so far as value is concerned—received a general check last year; but the possibilities of impending war caused a curious diversion of the trade with Wallachia and Moldavia, our imports therefrom being more than doubled, and our exports thereto showing a sad falling off. Our imports from foreign countries were in value 290,822,127*l.*, and our exports 186,626,713*l.* to foreign countries; whilst those to British possessions added 84,332,576*l.* to the imports, and 70,149,889*l.* to the exports. Taking the chief articles of trade, we imported considerably more animals, meat, butter, corn, eggs, fish, jute, fruit, glass, preserved meats, wood and timber, and woollen and worsted yarn, though the value was occasionally less, whilst in many other of the chief articles there was a decrease; and we retained generally more of the principal articles, paying import duty for home consumption. Taking some of the latter of these, the quantities retained for home consumption are reducible as follows:—Bacon and hams, 9·49 lbs. per head of the population were retained; butter, 5·54 lbs.; cheese, 5·03 lbs.; eggs, 22·75; potatoes, 20·37 lbs.; rice, 10·27 lbs.; corn, 167·80 lbs.; tea, 4·50 lbs.; tobacco, 1·47 lbs.; raw sugar, 50·16 lbs. The grain imported was less, there being a falling off in the quantities of wheat brought in from the southern ports of Russia, from Sweden, Denmark, and Germany; from France, British North America, and the United States; whilst the imports from Spain, Chili, Holland, and one or two other countries were greater. Our exports of British and Irish produce fell off, showing in value a falling off to Russia, Sweden, Denmark, Germany, Holland, and other of our chief customers; whilst to France, Spain, and one or two other countries there was an increase. We sent out more cotton, yarn and manufactures, less linen and more jute, less iron and steel, and less woollen and worsted yarn and manufactures.

Turning now to the navigation returns, it is ascertainable that there is a general and, in the total, a large increase in the tonnage of vessels entering and clearing at ports in the United Kingdom,—the total entrances and clearances being 50,784,902 tons, against 46,276,838 tons last year. The steam-vessels only supply

27,169,037 tons of this, but the increase is scarcely up to the ratio of late years in this respect. The tonnage built last year is stated as 236,890 tons of sailing vessels, and 123,475 tons of steam-vessels,—the number of vessels built being 687 sailing, and 320 steam. Passing on to agricultural returns, it may be said that the acreage under corn and green crops was less, that under flax and other crops was slightly more, as also were those in permanent pasture, orchards, &c. Monetary statistics follow; and they show in the first instance that the Post-office Saving's-Banks received more in deposits last year than in any previous year, and the payments were also higher. The capital was 26,996,550*l.* for the whole of the kingdom. The savings-banks under trustees received slightly less than in the previous year, and the repayments were also less, the capital standing now at 43,283,570*l.* The rest of the financial statements cannot be satisfactorily compressed. The postal returns show continuous growth. The number of letters delivered during the last year was for England and Wales, 856,000,000; for Scotland, 91,000,000; and for Ireland, 72,000,000. Or placing it in another light, every hundred of the population received last year 3,520 letters in England and Wales; 2,579 in Scotland, and 1,354 in Ireland. In addition to these, there were delivered in England and Wales 242,000,000 newspapers and book packets; in Scotland, 33,000,000; and in Ireland, 24,000,000; and over the United Kingdom, 93,000,000 post-cards. The telegraphic messages forwarded were, in England and Wales, 17,671,518; in Scotland, 2,383,820; and in Ireland, 1,519,869. In addition to this vast mass of communication, the postal department issued 14,766,117 money-orders in England and Wales; 1,418,753 in Scotland; and 1,137,263 in Ireland; the amounts for which they were issued being:—England and Wales, 23,063,803*l.*; Scotland, 2,367,283*l.*; and Ireland, 1,994,254*l.*; all of which amounts show an increase over preceding years, like that of the postal work generally. The population last year was estimated as having attained to 25,547,309 for England and Wales; 3,560,715 for Scotland; and 5,336,395 for Ireland. The births were 887,464 for England and Wales; 126,749 for Scotland; and 140,438 for Ireland: the deaths, 510,308 for England and Wales; 74,122 for Scotland; and 92,499 for Ireland: and the marriages, 201,835 for England and Wales; 26,563 for Scotland; and 26,503 for Ireland. Education continued last year to make vast strides, there being 17,787 schools inspected; accommodation for 3,946,775; and 2,830,523 children present at inspections. There was a further decrease in pauperism, traceable to the falling-off in out-door paupers, but there remained a total of 728,350 paupers, exclusive of vagrants, in England and Wales; 100,105 in Scotland; and 78,528 in Ireland. The convictions for crime were more: there were 12,195 convicted in England and Wales last year; 2,039 in Scotland; and 2,344 in Ireland. Emigration was checked in the ratio of increase, and immigration was also lessened.

The mileage of railways open was increased from 11,789 to 11,989 for England and Wales; from 2,721 to 2,726 for Scotland; and from 2,148 to 2,157 for Ireland. For the whole of the kingdom, the total paid-up capital was 658,214,776*l.* The passengers carried numbered 538,681,722,—being in the proportion of 31,928 per mile; the total traffic receipts were at the rate of 3,551*l.* per mile, and the working expenses 33,535,509*l.* The mineral statistics show that 131,867,105 tons of coal, 6,365,462 tons of pig-iron, 4,322 tons of fine copper, 57,435 tons of metallic lead, 9,614 tons of white tin, and 6,717 tons of zinc, were raised or produced in the kingdom last year, the estimated value of the total metals produced from British ores being 64,640,232*l.* at the place of production, a slight declension on the previous year's value, but due to fall in price rather than to lessened quantity.

The Trees in Paris.—The annual cost of keeping in order the trees, shrubberies, and seats upon the boulevards and in the public squares and gardens of Paris is nearly 2,000,000*f.* It is estimated that the trees in the avenues and boulevards of Paris number 82,201; those in the cemeteries, 10,400; and those in the squares and court-yards of various buildings, 8,300. There are also 8,000 seats for the accommodation of the public. The expense of keeping up all the extra-mural recreation grounds, exclusive of the Bois de Boulogne and the Bois de Vincennes, is rather more than 300,000*f.*

SCHOOLS FOR TEACHERS.

UNDER the above heading attention was directed in the *Builder* of October 23rd, 1875, to what was considered a palpable anomaly and grave defect in the Elementary Education Act of 1870; an insuperable obstruction in carrying out to a legitimate issue the purposes of the Act; and that furnishes a valid and rather grievous ground of complaint to a large number of young people, the pupil-teachers, who have been induced to enter upon the teaching profession with expectations that must, in many cases, be doomed to disappointment. The defect referred to is this, that only a small proportion of the pupil-teachers who serve their apprenticeship, pass successfully all their examinations, and seek the admission to training colleges to which they are entitled, will find accommodation provided for them in such institutions.

It was stated in the article referred to that the accommodation in existing training colleges was already stretched to very nearly the utmost limits, and that no provision, or almost none, existed for the large number of additional applicants that would present themselves one year after another, as their terms of apprenticeship in Board schools expired. The first batch of these apprentices has recently dropped in, and the number will considerably increase from year to year for some time to come. The discrepancy between the available accommodation in training colleges and the number of pupil-teachers offering themselves for the necessary Government examination, is even greater than was feared. To take the recent examination at Stockwell Training College for Girls as an illustration. Six hundred candidates were eligible, and underwent examination, but there were only sixty vacancies in the college! It is not necessary to assume that all the 600 will have passed the examination successfully: the result of the examination is not yet known, but it may be safely assumed that a much larger number than sixty will pass, with the mortifying result to many of them of being prevented from assuming the status to which they are entitled, and, hindered in their career, remaining simply "uncertificated ex-pupil teachers," instead of becoming eligible to take situations as certificated assistants or mistresses of schools.

That this anomaly is certain to become greater as the School Board system becomes more fully developed will be apparent from the following figures:—At the 30th of June, 1875, the London School Board had 199 schools under their direction; at March 23rd the number had increased to 238. For the two periods respectively there were 436 and 567 departments, *i.e.*, boys', girls', infants', and mixed schools, the last including boys and girls. The total accommodation at the two dates was for 112,901 and 156,662; on the rolls, 115,414 and 149,454; average attendance, 88,749 and 119,729, or 76·9 and 80·1 per cent. of the number on the rolls. Masters and assistant masters, 419 and 647; mistresses and assistant mistresses, 692 and 1,038; male pupil-teachers, 397 and 445; female, 906 and 1,095. The candidates for apprenticeship have fallen away considerably, the numbers for the earlier date being boys 122, and girls, 298; but for the later, only 71 and 222 respectively. The totals of apprenticed teachers for the two periods are 1,303 and 1,540.

In passing, it may be mentioned that the general average of the Government grant in aid of the education in London Board schools is 14*s.* 8½*d.* per scholar. The highest grant, 17*s.* 6*d.*, is taken by the Greenwich division, and the lowest, 13*s.* 6½*d.*, by Hackney, which is the most populous division within the London School Board boundary.

As bearing on the need there is for more and better *trained* teachers, it should be mentioned that the complaints of inefficiency by the Board's own as well as by the Government inspectors continue as numerous as in former years.

The complaint continues, that pupil-teachers in their first and second years are almost useless. For this defect it is confessedly difficult to provide a remedy. An economical aspirant after musical culture, on being told that the terms for the first twelve lessons would be four guineas, and for the second twelve lessons two guineas, proposed to take the second course first; but the gulf could not be so leapt over in his case, nor can the first course be dispensed with in the case of the pupil-teacher. If the monitorial is not to supersede the pupil-teacher system it is manifest that, at whatever age commencing, there must be a first and second year of apprenticeship, and to secure a supply of practised, trained, efficient teachers, it should be evident that young persons of both sexes should be brought up to the art of teaching by actual engagement in the work. But there is surely a great deal of useful work for which pupil-teachers of the first and second years should possess the requisite educational attainments. A Board inspector reports concerning 33,889 scholars, that 13,554 were in Standard I. or lowest; 8,844 in Standard II.; 6,060 in Standard III.; 3,357 in Standard IV.; 1,585 in Standard V.; and only 489 in Standard VI. That is, about double in the lowest two standards of the number in the four above them. Young persons "apt to teach" with the requisite qualities in temper and firmness, might surely be useful in the lower classes.

The School Management Committee of the London Board has prepared a scheme which will effect an important modification of the pupil-teacher system, but does not materially affect the question of inadequate accommodation in training colleges.

The estimated cost of carrying out the scheme is, for 351 additional assistant-teachers, 30,000*l.* per annum; teachers at centres at 5*s.* per hour, 4,500*l.*; travelling expenses, 1,000*l.* — total 35,500*l.*

Reverting to the defective accommodation in training schools, it would be unwise to encourage the Board to enlarge their expenditure. We have no inclination to cavil about the somewhat costly scheme above referred to. The Board has done a great work in building and acquiring 238 schools, in providing accommodation for 157,000 scholars, and in enrolling 150,000 children. These children are worthy objects of their care, but the 1,800 pupil-teachers have also their claims. The Board schools are in many places almost in clusters; in some portions of the region south of the Thames, to the east of London Bridge, they seem almost as thick as autumnal leaves that strew the brooks in Vallombrosa. It is not insinuated that they have been planted where they are not needed, but supposing the 238 schools had two added,—and what would they be among so many!—one a training school for males and another for females, their establishment would only be an instalment of justice to pupil-teachers, a proof of loyalty to the Act of 1870, and an obliteration of what seems a stultification of the Board and its action.

The answer of the Board to this plea is, we know, that "the department" will not allow them to provide training schools, which should be initiated at least by "voluntary effort." Voluntaryism in education has been tried and found wanting, and that was the *raison d'être* for the passing of the Elementary Education Act. Why should not the Board try to obtain Parliamentary powers for providing the accommodation in training schools needed by their own apprentices?

THE REPORT OF THE COMMITTEE ON EMPLOYERS' LIABILITY FOR INJURIES TO THEIR SERVANTS.

WE have previously, on several occasions,* drawn attention to the present state of the law as regards the liability of masters for injuries caused to servants by fellow-servants, and we have pointed out how it has been laid down again and again by the judges of the land that a master is not in such a case civilly liable for such injuries. It may possibly be in the recollection of some of the readers of the *Builder* that in the course of the session of 1876 a Committee of the House of Commons was appointed to inquire into this question, and that this Committee, being unable to wholly perform its work during the session of 1876, was reappointed at the beginning of the session of the present year. Their report has now been issued, and it is one of a very concise character, and is quite certain to have an important effect on this subject. Taken as a whole, it will be disappointing to the general body of workmen, and acceptable assuredly to the employers. For, speaking broadly, it does not consider that the present principles of the existing law are objectionable. On the contrary, it goes so far as to criticise with considerable severity the long-established principle that a master is responsible for injuries done to strangers by his servants, so long as they are acting within the

* See the *Builder*, February 17, March 10, April 7.

scope of the duties for which they are engaged "There is a strong concurrence of authority," says the Committee, "against the justice of this law, though there seems to be some difference of opinion as to its origin and historical development," and after examining the various theories, they add that the last of these is "an analogy which may explain, if it does not justify, the law." Such being the opinion of the Committee on the general question, it was not to be expected that they would look with disfavour on the exception to it which exists as regards masters, workmen, and fellow-workmen, and they naturally came to the unanimous and important conclusion that "your Committee therefore are of opinion that no case is made out for any alteration in the law relating to the liability of employers to their workmen for injury in the course of their employment, except in the matters to which they now proceed to refer." This is clearly a judgment which will prevent, for a time, at least, any legislative changes in the existing law as regards the general principle. But it is also noteworthy that this Committee had rather to form a definite conclusion upon already well-known facts than to investigate a large number of details, and therefore their opinion is likely to be of less weight than if the world generally was not as capable as Mr. Mundella or the Attorney-General of forming an opinion. But, again, the impartial character of the Committee, having upon it members so thoroughly the workmen's friends as Mr. Macdonald, Mr. Mundella, and Mr. Hopwood, must clearly prevent workmen from impugning the justice of the general conclusion at which the Committee has arrived.

Let us pass on to the changes which are recommended. It is a doctrine of law that if it can be proved that the master has omitted to provide the servant with proper materials and resources for the work in hand, such as engines or scaffoldings, or has been negligent in the choice of persons to whom he intrusts the supply of such materials, or has been guilty of want of care in the selection of proper servants, then he is liable for injuries even to his own servant. But actual personal negligence on the part of the master must be shown. Now, considering the number of modern companies and partnerships, it is perfectly obvious that this rule must frequently be a mere dead letter. The committee, therefore, recommend that when the functions of the master are delegated to agents, the defaults of the agent in such a case shall be considered the defaults of the master.

The second suggestion is that "the doctrine of common employment has been carried too far when workmen employed by a contractor, and workmen employed by a person or company who has employed such contractor, are considered as being in the same common employment." There can be no doubt that a blot is here pointed out, and the alteration, if carried out, will go a long way towards preventing the existing rule as it is to stand from pressing with undue harshness on workmen, or from being too lenient to employers. But, nevertheless, it is quite certain that it is much easier to give the above opinion than to carry it into practice. What is a common employment, is an exceedingly difficult question to answer, and depends upon the circumstances of each particular case. It is this very difficulty, indeed, that has caused the extended application of the present law; for once give it a range of any width, then precedent after precedent continually broadens it. It appears to us, therefore, that some such definition of the words common employment, as "hired or paid by the same master," will have to be put in the statute-book if the advice of the Committee and to be of any real and practical value. But if some such course is taken, the labours of this Committee will have not been without their value. On the whole, the recommendations contained in this Report seem to savour somewhat of a compromise between the interests of masters and workmen, which is scarcely as satisfactory as might have been hoped for. For the first suggested change in the law is a clear blow to the existing doctrine, and a lever which may well be used to overturn the whole doctrine, especially as the views of the Committee on the general question are based upon a dislike to the whole principle of liability of masters for acts of agents. But there can be no doubt of the importance of the suggestions of the Committee, from a legislative point of view, having regard to future enactments, and from the effect they will have, so far as they go, upon the relations of employers and employed.

HEALTH AND SEWAGE OF TOWNS.

THE Executive Committee of the Society of Arts on the Health and Sewage of Towns report that the Conference held this year applied itself especially to the dry systems, as distinguished from the water-carried systems discussed last year. The Committee have passed the following resolutions:—

"1. That the pail system, under proper regulations for early and frequent removal, is greatly superior to all privies, cesspools, ashpits, and middens, and possesses manifold advantages in regard to health and cleanliness, whilst its results in economy and facility of utilisation often compare favourably with those of water-carried sewage.

2. That hitherto no mode of utilising the excreta has been brought into operation which repays the cost of collection.

3. That the almost universal practice of mixing ashes with the pail products, though it applies these as a convenient absorbent, and possibly to some extent as a deodorant, is injurious to the value of the excreta as manure.

4. That, for use within the house, no system has been found in practice to take the place of the water-closet.

5. That, although there are appliances and arrangements by means of which the sewer-gases may be effectually prevented from entering houses, they still do so in the great majority of dwellings, both in town and country, including the metropolis.

6. That it is of the highest importance, in a sanitary point of view, that the metropolitan and local authorities should exercise great vigilance with respect to this matter, and that it should be made by law the duties of these bodies to enforce efficient measures for the exclusion of sewer-gases from dwellings, and to watch over their being efficiently carried out under such a system of payment as shall not press too heavily on those at whose charge the work is done.

7. That in every large town plans of its drainage should be deposited with the local authorities, and be accessible to the public.

8. That all middens, privies, and cesspools, in towns, should be abolished by law, due regard in point of time being had to the condition of each locality.

9. That the annual accounts of the sanitary authorities, especially in great towns, should be prepared and published in sufficient detail."

NEW BUILDINGS IN BERLIN.

THE PRINGSHEIM MANSION, WILHELMSSTRASSE, BERLIN.

THE German capital cannot boast of a wealth of interesting and characteristic private buildings, especially not such as date from former times. It was only in the second half of the seventeenth century that the genius of the architect Schlüter presented Berlin with a small number of residences of striking features. At last, after a long period of stagnation, the architect Schinkel, in the nineteenth century, exerted a distinctly regenerating influence upon the architectural character of the city. The greater number of the better private buildings which have risen since that time are indebted to the pupils of Schinkel for their origin. They are all distinguished, besides a laudable tendency for pleasing appearance, by a certain poverty of material; for stucco and zinc castings were hitherto the usual means employed for producing the dazzling effects of modern Greek style.

Recent generations of architects, on the contrary, approached again towards Italian Renaissance; and at the same time they were actuated by a desire of emancipating themselves, wherever the means offered permitted of it, from the use of surrogates, which had increased considerably in the preceding periods of architecture. This, the selection of building material, will always remain an essential question in the architectural development of Berlin, sandstone of the required quality not being found in sufficient quantities in the Mark of Brandenburg. It must consequently be considered highly satisfactory, and of significance for the architectural progress of Berlin, that recently architects have again turned to the finer descriptions of bricks, which had been used in Brandenburg from the earliest times. Their application was renewed successfully by Schinkel—examples of his being the Academy of Architecture, the residence of the Feilner family—the pottery manufactory of March contributing not a little by its artistic productions in extending their use. One of the most interesting and richest examples of this style of architecture is the residence of Herr Pringsheim, one of the more fortunate actors in that period of mad speculation, not to say of bubble company mongering, which is known in Germany as the *Gründerperiode*, and which is considered by many as one of the dire effects of the milliards paid by France. However, Herr Pringsheim was wise enough to retire from the giddy sphere of reckless venture in time, and he was also wise enough to apply his gains in a suitable manner, by raising for himself a handsome edifice in the Wilhelmsstrasse, near Unter den Linden, the model of which house was the subject of great admiration at the Vienna Exhibition of 1873.

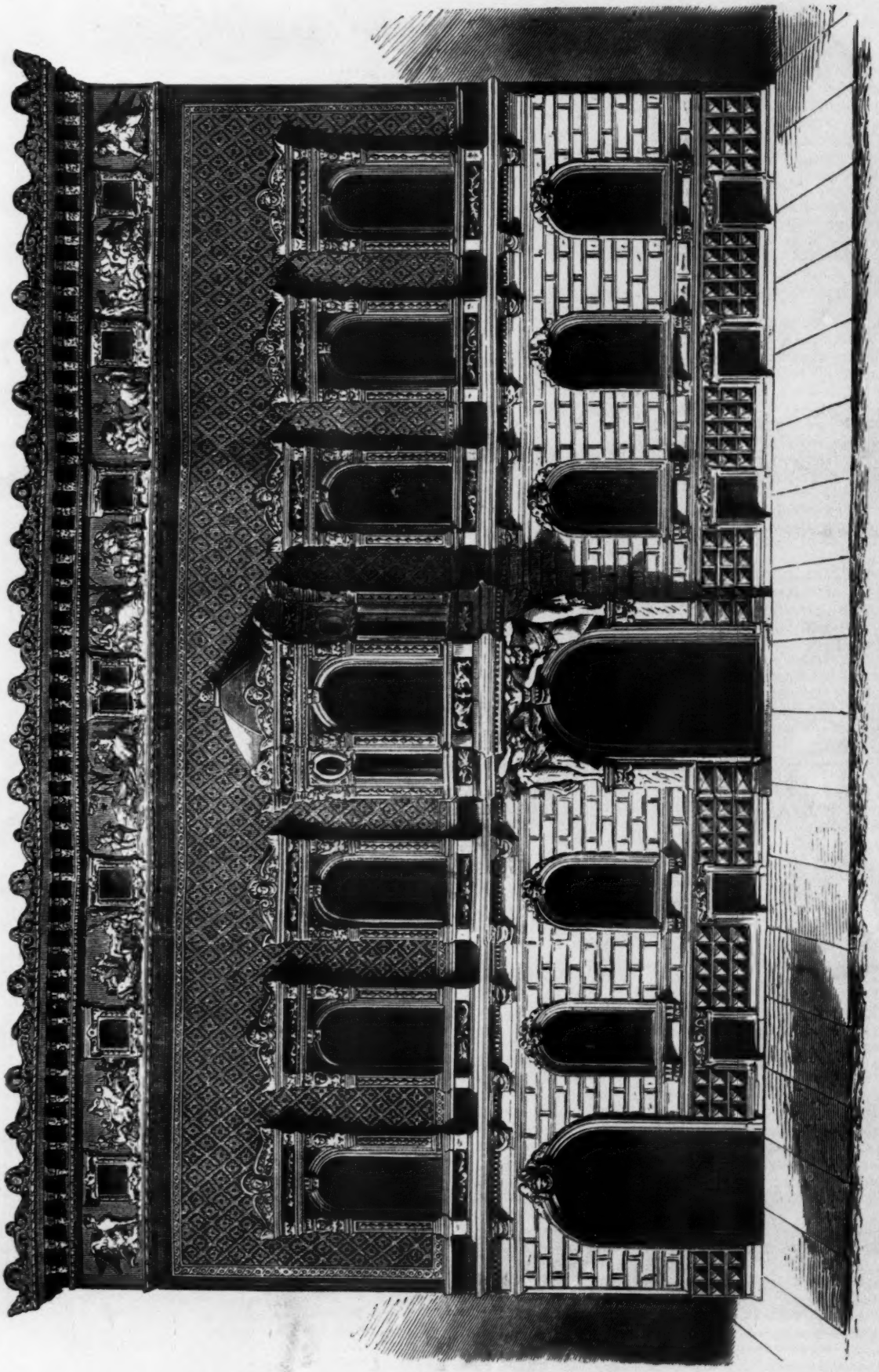
The architects are Herren Ebe and Breda, and their work is a pure terra-cotta erection. By using the term terra-cotta, instead of brick, it is to be intimated that, all the membering of the mouldings and the ornaments being executed in burnt clay, the form of the ordinary brick is no longer the dominating feature. Since Schinkel, the buildings of which Cramer was the architect, especially the Anatomical Museum and the Chemical Laboratory, were the first representations of a more correct application of terra-cotta forms. Here it should be remarked that greater demands are made in this respect as regards private buildings than for public edifices; in the latter of which erections more imposing proportions are the rule, neatness and elaborateness of detail being dispensed with in favour of a more sober architecture. To attain this pleasing appearance in private buildings, a more complicated ornamentation becomes necessary, especially a greater variety in colour, whereby the possibly absent effect of shadow resulting from the outlines of the ornamentation is supplied. This involves the avoidance, as much as possible, of raw brick as a surface acting as a decoration.

Fully conscious of the task set before them, and of the difficulties attending its happy accomplishment, the architects of the building which is the subject of our illustration made the attempt of doing justice to the terra-cotta style of architecture in the principal story,—for the ground story, being executed in sandstone, is not taken into consideration,—so that also in this respect a decided progressive tendency might be perceivable. It should not be forgotten that the proprietor, fully aware of the object to be attained from an artistic point of view, gave *carte blanche* to the architects with respect to cost.

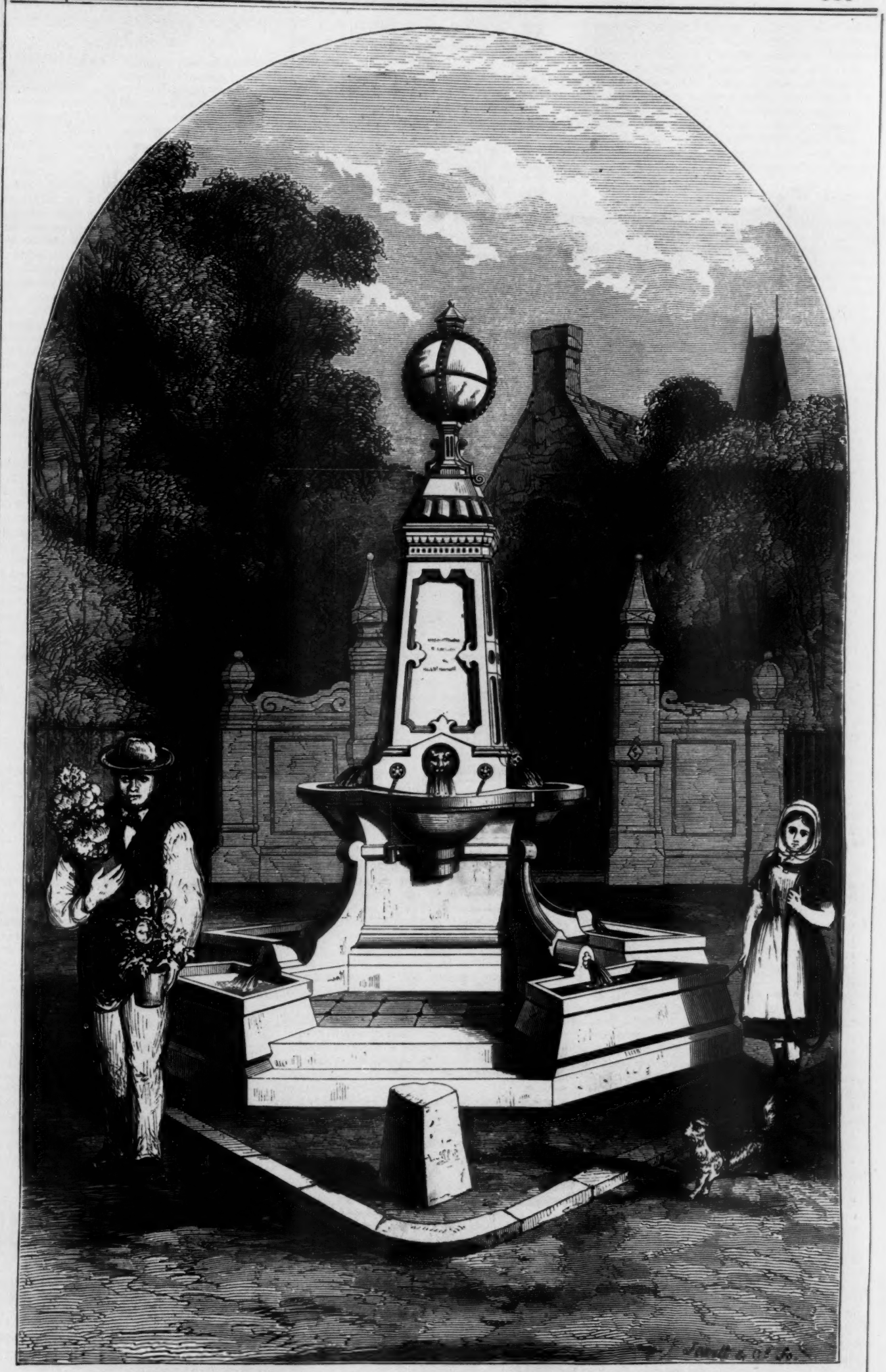
In the first place, all the framings and membrings are constructed of large terra-cotta pieces; the dressings of the windows in brilliant yellow; the friezes and the entablature in dark brownish red, unglazed; the parapet mouldings and gutterface glazed in olive-grey colour. The ornamental work is everywhere held in its natural yellow clay colour; only here and there parts have been rendered more prominent by yellow glazing; but the ground is everywhere treated with coloured glazing. The ground of the crown of the entablature, the soffit panels, the panels between the consols of the entablature, and those in the window crowns, appear in a delicate greyish blue, which is also employed for the necks of the window pilasters. The ground of the panels under the windows, on the contrary, is a dark reddish brown; while the ground of the delicately ornamented window pilasters is a darker shade of terra-cotta, but unglazed. These terra-cottas were made in the manufactory of E. March, of Charlottenburg, and are executed with the greatest care.

All those coloured ornaments are held together in their effect by the full reddish-brown ground tone of the quiet surface of the façade. The latter, in the same tone, but patterned in a somewhat lighter shade, was executed in the well-known manufactory of Villeroy and Roch at Mettlach. Although the façade surface proper is covered with a coloured clay mosaic, it attains its consummation in the frieze, which is in coloured glass mosaic upon gold ground, executed after the designs of A. von Werner, in the manufactory of Salviati, of Venice. The composition of this frieze presents in the eight panels separated by the windows a symbolic representation of the principal periods of human life. They are "Happy Childhood," "The Mirthful Feast of Poetry," "The Love of Youth," "Conjugal Felicity," "The Work of Creative Man," and, finally, "Clio taking down at the deathbed of Age the deeds of an industrious life." The execution of these mosaics is excellent, and worthy of the masterly composition.

Though we have not conveyed an adequate impression by the above description and our illustration of the outward appearance of this interesting building, some idea may from them be formed of its *tout ensemble*, which reminds us of some of the old Venetian palaces. As regards the artistic completion of the several rooms, it is at least on a level with its outward architecture. We may mention, however, with respect to its ornamentation that the execution of the frescoes of the principal apartments, such as the ball-room and the dining-room, was intrusted to some of the most eminent painters in this *genre* of Berlin, Düsseldorf, and Munich.



NEW BUILDINGS IN BERLIN: THE PRINGSHEIM RESIDENCE, WILHELMSSTRASSE.—HERREN EBE & BENDA, ARCHITECTS.



THE WEBSTER MEMORIAL FOUNTAIN, DULWICH.—MR. CHARLES BARRY, F.S.A., ARCHITECT.

THE WEBSTER MEMORIAL FOUNTAIN, DULWICH.

We illustrate a monument erected recently in Dulwich to the memory of a worthy man, Dr. George Webster, who for sixty years had resided there, and had been identified with the changing fortunes of this charming locality. Up to the year 1858, Dulwich was but little known, save as a lovely suburb of the great metropolis, but since that year, when under the reforming hands of the Charity Commissioners a new scheme for the application of the revenues of the estate of old Edward Alleyn was adopted, and they were to be mainly applied towards the endowment of a great public school, the place has become of more general interest.

In its old days and under its new condition, Dr. Webster always took the liveliest interest in its affairs, and acted as magistrate, guardian of the poor, and in other more or less public functions. In 1875 the feelings of respect and gratitude with which he was regarded prompted some of the inhabitants to suggest that some general recognition of them was due to him. The response to their suggestion from all classes was immediate and universal. It was then ascertained that the doctor would accept nothing for himself, but would feel gratified if his name might be identified for ever with the place to which he was so much attached, by the erection of a public drinking fountain in the village. On hearing this a committee was at once named to carry out the idea, and the result is the structure we have engraved. Of this committee, Mr. C. W. C. Hutton, J.P., lately Sheriff of London, was appointed chairman, and Mr. Fleming, one of the oldest inhabitants of Dulwich, the secretary and treasurer.

Only a few days after the first meeting of the committee (on the 16th November, 1875), the object of their solicitude was struck down by death after a few hours' illness; and a further calamity occurred, for at a meeting of the committee on the 24th March, 1876, it was announced that their respected secretary, Mr. Fleming, had also died suddenly on the 17th of that month.

In the meanwhile, however, Mr. Charles Barry, architect to the Governors of Alleyn's College, had prepared a design, which, having been approved by the committee, was submitted to the governors and approved by them, when they generously gave a site for the erection of the memorial in a prominent position in the village and close to the residence wherein Dr. Webster had passed nearly all his life.

The fountain is constructed of granite from the quarries of Messrs. Sheares & Smith, at Dalbeattie. Grey granite, finely axed, being used for the steps and water-troughs for cattle, while the superstructure is of red granite, polished. Its pyramidal apex is surmounted by a handsome lamp, executed in bronze, partly gilt, the whole from the designs and under the superintendence of the architect. The parish of Camberwell has contributed the sum of 50*l.* by way of a small help towards the annual expense of maintenance of the fountain and its water supply, the whole burden of which (subject to the donation) has been most generously undertaken by the Metropolitan Drinking Fountain and Cattle-Trough Association, who have also at their own expense put in the foundations, and also supplied the pipe-work for the water supply, and whose secretary, Mr. John Lee, has rendered valuable assistance to the architect. The cost of the work, exclusive of the foundations, has been about 375*l.*, which sum has been raised by subscription in the neighbourhood where the late Dr. Webster was so well known for over sixty years, and so highly esteemed.

The fountain bears the following inscription:—

"A.D. 1877.
To commemorate the long and varied services, public and private, of
GEORGE WEBSTER, M.D., J.P.,
for more than sixty years an inhabitant of Dulwich,
This Fountain is erected from the
Contributions of his many friends and neighbours of every station.
He died 19 Nov. 1875. Aged 78 years."

The fountain was opened to the public on the 6th inst., without any ceremonial.

Books.—A catalogue of second-hand books, 232 pages, just now issued by H. Sotheran & Co., 36, Piccadilly,—a quaint house, of which we gave a view some time ago,—includes a large number of architectural, scientific, and artistic works. Some of our readers may be glad to know this.

CONGRESS OF BRISTOL AND GLOUCESTERSHIRE ARCHÆOLOGICAL SOCIETY.

The annual "outing" of this society was held at Cirencester on the 28th, 29th, and 30th of August, under the presidency of Earl Bathurst.

The annual business-meeting was held in the Corn Hall. Sir William V. Guise, the retiring president, having vacated the chair in favour of Earl Bathurst, Mr. P. Hallett, the general secretary, submitted the annual report of the council, who said they believed they might congratulate the society on its satisfactory progress during the year.

The members now amounted to a total of 513, which included 501 subscribers. This showed a net increase since the meeting at Gloucester of forty-eight subscribers. The finances, too, were satisfactory. The balance in the hands of the treasurer, after deducting the estimated cost of the annual volume of transactions, was about 607*l.*; of this total the life subscriptions amounted to 404*l.*, which it was considered desirable to invest as a funded capital. . . . Since the summer meeting at Gloucester last year the society had held two winter meetings,—one at Bristol and the other at Cheltenham. . . . . The subject of the formation of an archæological museum and library was alluded to by several speakers at the Gloucester meeting, but nothing thereon had as yet been determined. The council had already made certain purchases of books, and they had to thank Mr. Long, of Wrington, Mr. Playne, of Nailsworth, and Mr. G. T. Clark, of Dowlais, for the presentation of works to the society. . . . . One important object of the society, mentioned in its constitution, is the preservation of ancient local monuments. With this object in view a committee was formed at the Bristol meeting in December last for the preservation of St. Werburgh's tower. This tower is a handsome member of the Bristol group of towers of the fifteenth-century date, which a private Act of Parliament, obtained for the so-called removal, but, in an historical sense, for the destruction, of St. Werburgh's Church, had given the Bristol Town Council powers either to preserve or demolish, as it saw fit. The committee, in conjunction with other committees formed at Bristol, had collected promises to the extent of nearly 1,000*l.*, in order to save the tower; and under the influence of their endeavours the Town Council rescinded a resolution it had passed adverse to the tower's continuance. In the delays, however, that followed other influences prevailed. The party of destruction again gained the ascendency, the Town Council recurred to its original position, and the tower was now apparently doomed. It would probably be deemed a lamentable circumstance that a great monument of Mediæval art and culture, with traditions extending back to the earliest periods of English history, should be thus sacrificed to what appeared little more than a narrow and short-sighted utilitarianism. . . . .

The report was adopted, on the motion of Professor Rolleston, seconded by Mr. Christopher Bowly, and the retiring members of the council having been re-appointed,

The President delivered his inaugural address, in the course of which he said:—

Cirencester,

The Corinium of the Romans, was a place of importance in the time of Julius Cæsar; four great roads met there,—first, the Foss; second, the Ickneild Way; third, the Irmin-street; and fourth, Aoman-street. In addition to the roads, there are various antiquities belonging to the Roman age. There is an area called the Bull Ring, which had long been considered a Roman amphitheatre, but this has lately been made a subject of doubt. Our abbey church occupies the first position in the town. Henry I. founded the abbey church, but little, if anything, remains of the structure. The present parish church was rebuilt when Hasketown was abbot, between the years of 1504 and 1522. An ancient church existed before. Having briefly referred to the history of Cirencester, the President made a few remarks on some of the places to be visited, and concluded by observing that although some might deem archæology a dull and unattractive science—and it certainly could not be compared in delight to the cheering sound of the hunter's horn, or to the excitement of the Newmarket races—yet it might be pursued by persons of moderate means, it added to our store of knowledge, and perhaps was not followed by extravagance and ruin.

Under the guidance of Professor Church, the members visited the Loan and Corinium Museums, and afterwards proceeded to Oakley House, where they were entertained by the President. At the Barton they inspected a good specimen of Roman pavement, which was described by Professor Church. Retracing their steps, they visited Cecily-hill, Park-street, Thomas-street, and Dollar-street, under the guidance of the Rev. E. A. Fuller, who explained that the street now called Cecily-hill was originally called Inchthrop-street, meaning, possibly, entrance to the town, and was the main entrance to the town from Stroud on the Oakley side. Later on it was called St. Cecilia-street, because of the Chapel of St. Cecilia, which was originally there. Hence the corruption—Cecily-hill. The Chapel of St. Cecilia was still in existence at the time of the death of Sir William Nottingham, in 1483. When Leland visited Cirencester in 1542 only the ruins remained. Thomas-street, he reminded them, just marked the inside of the Roman wall. Thomas-street was formerly Battle-street, probably so called from some storming of the town by King Stephen's or some other forces. It became Thomas-street from the hospital founded by Sir William Nottingham for the benefit of four poor weavers, and who had to pray to the shrine of St. Thomas of Canterbury in the parish church.

Proceeding to the Grove-lane, the first point to which attention was drawn was the old so-called Saxon arch, at the entrance to the abbey. Mr. Fuller pointed out that this arch was the means by which entrance was obtained to the abbey precincts, by a road leading out into the present Whiteway, or old Wigge Ham way. The arch had been wrongly called the "Saxon arch." It was a part of the buildings of the abbey, begun 1117. In 1131 they were so far advanced as to allow the first abbot, Serlo, to be appointed, and who was consecrated in that year at Brockley Church.

Progress was made to the Beeches, where Professor Church called attention to an earthen bank still existing, which supported the Roman wall, nearly in a line with those portions seen in the abbey grounds. The wall continued nearly straight for some distance, when it curved inwards twice, and worked round to the portions found in the workhouse garden. Having passed the New Mills, described by Mr. Fuller as formerly known as Fulling Mill, built by Albert Blake, on the site of a Roman tower, the course of the party was shaped to the New-road, the scene of Mr. Banks's excavations. Here Professor Church pointed out the remains of the Roman villa which Mr. Banks had discovered. A very large amount of foundations had been found, from which great quantities of stone had been dug, and among those foundations were discovered some pieces of sculpture preserved as freshly as if the sculptor's chisel had left them but yesterday. The pavements under which these sculptures were found were very rough and inferior. Sir William Guise called attention to the fact that some of the carvings were found among the *débris* of the foundations. Now, what was it caused the destruction of these important buildings? He had always thought that the destruction ensued in that period of Cimmerian darkness which overspread the whole country after the departure of the Romans, and no light was let in except by the few old monkish chronicles, &c., which bore upon the subject. At that time,—and Froude and Freeman took this view,—the Roman Brit had been undoubtedly reduced to a state of utter cowardice, and he called in the Danes to help him against the hordes of Picts who were destroying him and his houses. Then, according to his theory, came the time that these towns were destroyed and ruinated, reduced to a condition in which pieces of sculpture were mingled up with heaps of rubbish. That was, he believed, when the destruction occurred, otherwise they had nothing to account for the destruction of such an important town as Corinium, and the finding of pieces of sculpture indiscriminately mixed with the foundations. This was, no doubt, a place of great importance. Here were found grand cornices, fine Corinthian capitals, showing that a prætorium and other public buildings had existed; and yet the fragments of them were found levelled with the foundations. Nothing but destruction could have done it, and that destruction was, he thought, worked in the fifth and sixth centuries by the hands of the invading Anglo-Saxon race.

The Parish Church, Cirencester,

was next visited, and was explained by the Rev. E. A. Fuller. The church, dedicated to St. John the Baptist, was, he said, the largest of the whole of the parish churches in Gloucestershire, measuring internally from east to west 154 ft. On the north of the nave was the Trinity Chapel; on the south of the chancel was the Chapel of St. John the Baptist; the chapel on the north of the chancel was St. Catherine's Chapel; and to the north again beyond this was the Lady Chapel. The church also formerly included the altars of St. Thomas of Canterbury and St. Edmund the Confessor. There were eight chantries, viz., The Trinity, the Blessed Virgin Mary, St. Thomas the Martyr, St. Anthony, St. Christopher, St. Catherine and St. Nicholas, Jesus, and John Jones. During the fifteenth century there was also one of St. Edmund the

Confessor. As to the growth of the structure of the parish church, Mr. Fuller said there was nothing but the architecture to tell its own story. Of the Early Romano-British church in this town he could tell them nothing, and of the Saxon church not much. In the course of the restoration of the church, under the organ they found a bit of foundation which they thought might be connected with the Saxon church. The architecture told of a smaller Norman church, which he had marked on the plan. The chancel and nave were then narrow, and some time toward the end of the twelfth century the chancel was widened in the direction of the south, and in so doing some Roman pillars were used up. The nave was rebuilt apparently in the thirteenth century, and the original Lady chapel. In the fifteenth century a great deal was done—at the very beginning the tower was built, the huge flying buttresses being put up before the top story was put on, to remedy a settlement which had taken place in the lower stories. Trinity Chapel was built before 1440, as legacies in aid of its building had been found about that time. The Lady chapel was rebuilt about the same time, and about the same period the east corner of the south aisle (Garstang Chapel). By the end of the fifteenth century the church had grown to its present dimensions, and in 1514 the nave began to be rebuilt, though it was a long while about. Mr. Fuller fixed the date of the building of the great south porch at about 1500.

The annual dinner took place in the evening at the King's Head Assembly Room, Earl Bathurst in the chair. After dinner there was a meeting in the Corn Hall, where the subject of the "Prehistoric Interments of Gloucestershire" was dealt with in a very interesting paper by Professor Rolleston. Then followed a paper by the Rev. W. E. Hadow, vicar of South Cerney, on "Monumental Brasses at Cirencester and the neighbouring churches." The Rev. E. A. Fuller next discoursed of "The Relation of the Town to the Manor of Cirencester," giving a very graphic history of the town. This brought the proceedings of the first day to a close.

On the second day (Wednesday, the 29th), the members started in carriages from the market-place, and proceeded on an excursion to Calmsden, Chedworth, and Stowell. The first halt was made at the wayside cross at Calmsden, described in one of Murray's handbooks as "a picturesque wayside cross, supposed to have been erected by the Knights Templars of Quenington, who held a large possession here." The structure consists, according to Pooley, of four steps, "and a pedestal or socket, into which is inserted a taper octagonal shaft, surmounted by a cube whose sides face the four cardinal points." A drive of three miles from the cross brought the party to the parish church of Chedworth, the architectural features of which were described by Mr. Niblett, who thought the archway under the square western tower was decidedly the oldest portion of the fabric. The church consisted of nave, western tower, chancel, and north aisle. The west arch was Early Norman, and the columns dividing the aisle from the nave might be set down as Late Norman. After a picturesque walk through Chedworth Woods, the party arrived at the Roman villa at Chedworth, discovered by Mr. James Farrer about eleven years ago, on the property of the Earl of Eldon, at whose cost the excavations, together with the erection of the museum and the construction of the necessary protective coverings, have been carried out. The visitors having been conducted over the villa and the museum under the guidance of the Rev. W. Dyke, were entertained at luncheon on the lawn, by the hospitality of the Earl of Eldon. After a ramble in the woods for the inspection of the remains of a Roman temple, the cavalcade was reformed, and a drive along hilly and at times uncomfortably rough roads, through the village of Yanworth, landed the excursionists at the little village of

Stowell,

where the parish church was visited. The Rev. W. Wiggin, rector of Hampnett, acting as *cicerone*, said the church was probably of the fourteenth century. It was at present in a very dilapidated state, but was shortly to be restored, at the cost of Lord Eldon. The Rev. H. N. Ellacombe regarded it as a very early cruciform church, with only the demolished north transept missing. He considered it a very Early Norman church, and said the walls were undoubtedly Norman, with Early Decorated windows inserted. He was inclined to put the date of the church at between 1000 to 1050. Mr. Wiggin dissented, but Sir William Guise agreed with Mr. Ellacombe in regarding the church as being unquestionably an Early Norman structure. After much argument, the controversialists still remained firm in their respective convictions (according to the very copious report in the *Wilts and Gloucestershire Standard*, to which we are indebted). Stowell Manor House, the residence of Mr. Thomas Walker, was next visited. The house was built by one of the Atkinson family, about the end of the sixteenth century. The visitors were hospitably entertained by Mr. Walker, and afterwards returned to Cirencester, where the second day's proceedings were brought to a close with an evening meeting in the Corn Hall.

Roman Remains.

The first paper read was by Professor Church, "On Some Recent Roman Finds in and near Cirencester." In the course of the paper the author said: During many recent excavations for building purposes in Cirencester the interior decorations of walls have been found in great quantities—in cart loads, I may say. The colours are still adherent to the plaster and concrete, but the designs are not greatly varied or of particular merit. A marone ground with white lines and black border commonly occurs: two excellent specimens of yellow leafage ornament upon a marone ground have been fortunately secured for the museum. One of these was found in Cricklade-street, the other in the Leauses. An imitation granite pattern is common. But the most interesting piece of coloured plaster work bears upon it something more than an ordinary design, and I beg that this fragment be carefully inspected. I am more particularly anxious that persons familiar with similar relics found in Pompeii and Rome should examine this specimen, since its genuineness has been called in question by one or two gentlemen whose thorough acquaintance with such subjects I have reason to doubt. The object is an inscription in Roman capitals, forming a set of squared words, to which a much later origin than the fourth century had been assigned before the present discovery was made. The best archæological authorities who have seen the Cirencester example do not doubt its genuineness, while the circumstances of the find place its authenticity beyond suspicion: I beg once more to place them on record. During the levelling of a garden in the New-road, Cirencester, many coins and Roman tiles were daily disinterred. Captain Abbott watched the operations narrowly, and one day had his attention called to a fragment of wall plaster found, in his presence, by the ignorant workmen employed there, who saw letters upon it. Captain Abbott washed it and showed it to me, and subsequently deposited it in the museum. It must be recollected that it was not sold by the labourer, and that no one had any interest in producing a forgery, nor I may add, the very special knowledge required to do so. The letters absolutely agree in form with those of the graffiti or wall-scratchings of Rome and Pompeii, and run thus—

ROTAS
OPERA
TENET
AREPO
SATOR

Some discussion ensued as to the meaning of these words. Sir William Guise, writing afterwards on the subject, says:

At first sight they would seem easy to explain, and, as was suggested by one speaker, may read thus:—"Arepo, the Sower, keeps his wheel-works," or "keeps his wheels at work," but the merest tyro in Latin knows that by no form of grammatical construction can the words be made to bear correctly any such interpretation. Another speaker stated that some scholar somewhere had made the discovery that in some form of base Latinity "Arepo" means "a drill-plough,"—it might as well mean steam-plough for all the light it throws on the matter. Let us now examine the puzzle. It will be seen at once that the letters, read perpendicularly as well as from side to side, form the same words. "Rotas" may be read all round, so may "Sator." It will next be observed that "Rotas" and "Sator" are the same words reversed. The same is observable of "Opera" and "Arepo." There remains then only the word "Tenet," which seems to be the verb that governs the sentence, but in fact while serving that purpose it supplies the letters needed to construct the anagram. Thus, under the specious guise of a Latin sentence, which has no real meaning, an ingenious puzzle is contrived, which has served its purpose when it has amused or surprised its readers. I am told that it has been found in an Early Mediæval work; possibly it may date from the period of the Lower Empire; but it bears about it so strongly the marks of monkish ingenuity, that I should be disposed, unless there be good evidence to the contrary, to believe that it had its origin in the cloisters. The appearance of the words on a Roman tile in the Museum of Cirencester would seem to militate against this theory; but a whisper has reached my ears that the manufacture is of far more recent date, and that there was one at least at Cirencester who could have thrown light upon the subject. This ought to be inquired into; as although the inscription is in itself of no special importance, the fact of its genuineness is.

The Rev. G. H. Moberly, rector of Duntisbourne Rous, followed with an interesting paper on "Local Names near Cirencester"; and Mr. Wilfred Cripps read some "Notes on Ancient Church Plate at Cirencester"; and a paper on "The Disarmament of Suspected Persons in the county of Gloucester," contributed by Sir John Maclean, F.S.A., was read by Sir William Guise, in the absence of the author.

The concluding meeting was held in the Corn Hall on Thursday, the 30th, when it was announced that the council recommended Bristol as the place of meeting for next year. This recommendation having been confirmed, some formal business was transacted, and the members proceeded on an excursion to Ampney, Fairford, and Bibury. The first halt was made at Ampney Crucis, where the members inspected the now-restored ancient "Cross of Ampney Holy Rood," in the churchyard. The church was then inspected, Sir William Guise expressing an opinion that it was of about the year 1200, of Norman architecture,—built during the Norman transition,—its transepts being of a later period, and the doorway not being of a Norman character. The party then proceeded on to Fairford, where the Rev. J. G. Joyce, of Strathfieldsaye, read a paper on the celebrated stained-glass windows. The homeward journey was *vid* Quenington and Bibury. At the former place the church was visited, and the visitors were hospitably received by Captain Maunsell Williams and Mrs. Williams at Bibury Court, a fine specimen of a Cotswold Manor House. Bibury Church having been inspected, the excursion was brought to a close, and with it the three days' meeting, which appears to have been a success.

INDIAN RAILWAYS.

MR. JULIAND DANVERS, the Government Director of Indian Railways, has just issued his report for the year 1876-77. We extract some passages from it:—

"During the year 1876, 479 miles of new line were opened for traffic. The whole extent now completed is 6,948 miles. Of these, 767 are constructed with a double, and 6,179 with a single line; 5,748 are on the 5 ft. 6 in. gauge, 1,162 on the metre, 27½ on a 4 ft. gauge, and 20 in the Guicowar of Baroda's territory on a 2 ft. 6 in. gauge. The lines opened since the end of 1875 comprise 297½ miles of the South Indian Railway, which is now complete, with the exception of a section, 37 miles in length, south of Cuddalore; 103 miles of the Northern Punjaub State line, extending from Lahore to Jhelum; 20 miles of the Rajputana; 13 miles of the Holkar State Railway between Kandwa and Chual Choki, and between Mhow and Indore; 36½ miles on the Neemuch State Railway, and nine miles on the Pali branch of the Bombay and Baroda Railway. I understand also, although it has not been officially announced, that the line from Rangoon to Prome has been opened. At the same time progress has been made on other lines in course of construction. The Pali extension of the Dakor branch of the Bombay, Baroda, and Central India Railway is an illustration of the moderate cost at which railway works may, in favourable situations, be executed. The line is 13·83 miles in length, is of the 5 ft. 6 in. gauge, and is laid with 60 lb. rails on iron bowl sleepers. The stations are plainly built, but of sufficient size for their purpose. The total cost has been 614,950 rupees, being about 4,000*l.* a mile.

Out of a total of 107,036 persons employed on the 6,624 open miles of railway on the 30th of September last, 101,254 were natives, 3,032 were Europeans, and 2,750 East Indians. The number of deaths amongst the Europeans was 60, or about 2 per cent.; amongst the East Indians, 34, or 1·24 per cent., during the preceding twelve months. The Europeans, it will be seen, form only 2·83 per cent. of the whole number employed.

The development of the resources of the country which is now taking place, and the large traffic which has ensued, point to the probability of more expenditure in future years for the additional accommodation and means of transport that will be required. The State lines on which the principal expenditure was incurred were the Northern Bengal, the Punjaub Northern, and the Indus Valley. The total amount of capital that has been expended up to

the end of the year was 109,364,867*l.*, of which 94,272,265*l.* was on account of guaranteed, and 15,092,602*l.* on account of State lines. The total amount of guaranteed capital that had been raised up to the 31st of March last was 94,832,562*l.*, of which 84,374,121*l.* consisted of share capital, 4,766,300*l.* of debentures, 5,422,458*l.* of debenture stock, and 269,683*l.* of capital not bearing interest. The net revenue derived from the railways during the year 1876 was 4,564,823*l.*, compared with 3,647,868*l.* of the previous year. The State lines, 935 miles in length, earned 113,401*l.*, and the guaranteed lines, 6,000 miles in extent, earned 4,451,422*l.* The guaranteed interest advanced during the year 1876 amounted to 4,634,222*l.*, so that there was a difference only of 182,000*l.* between that and the receipts. But inasmuch as certain lines earned surplus profits to the amount of 833,170*l.*, half that sum (after deducting 19,835*l.* contributed to the provident fund of the East Indian Railway) had to be returned to the companies. In the previous year the difference between receipts and guaranteed interest was 1,073,882*l.*, and the half surplus profits amounted to 173,506*l.* The net amounts chargeable against the revenues of the country for the two years respectively were, in 1875, 1,247,338*l.*, and in 1876, 588,467*l.* The number of passengers carried was 30,535,319, with an average mileage of 6,592 miles, compared with 26,779,437 of the previous year, and a mileage of 6,298. The proportion per cent. of the first-class was ·76, of the second, 2·24, and of the lower classes, 97. The amount of goods carried was 5,871,690 tons, compared with 4,388,660 of 1875. The proportion per cent. of the gross revenue from passengers was 33·84, and from merchandise, including minerals, 66·16. The expenses of maintaining and working the railways were 4,226,966*l.*, being 487,043*l.* more than the previous year, and 49·20 per cent. of the gross receipts.

BUILDING IN BRADFORD.

FROM two long articles which have recently appeared in the *Bradford Observer* we cull a few particulars as to some new buildings in that town.

A new pile of buildings is being erected extending from Kirkgate to Hustlergate, and having a frontage to the new street which supersedes the old Post-office passage. The new Liberal Club occupies the most prominent position in this new street, now known as Bank-street. The site was a costly one, varying from 46*l.* to 52*l.* per superficial yard, and, in order to obtain a revenue, the ground and basement stories of the Club buildings have been appropriated for shops, and also for the banking office of the Halifax Commercial Banking Company. Space has been reserved for a central front entrance from Bank-street, and a secondary entrance from Queensgate. The interior accommodation of the Club has been arranged on the three upper floors of the building. The club will be warmed by an apparatus supplied by Haden & Co., of Trowbridge. The building is of fireproof construction, on Fox & Barrett's system throughout. The style is Italian, and the cost of the building, exclusive of land and furniture, will be about 21,000*l.* The works are being carried out by Messrs. Crabtree Brothers, masons, Keighley; Mr. Robert Sugden, joiner, Keighley; Mr. Rushworth, jun., plumber, Shipley; Mr. Hird, iron-founder, Shipley; Mr. B. Dixon, plasterer, Mr. Smithies, slater, and Mr. E. Harland, painter, of Bradford. The furniture will be supplied by Messrs. C. Mills & Co., Bradford. Mr. Spencer has acted as clerk of works.

The adjoining pile of buildings has been erected for Messrs. Parkinson, Clark, & Co.'s drapery and silk mercery establishment, and from top to bottom is occupied by that firm. The shop front and fittings inside have been supplied by Messrs. Curtis & Sons, of Leeds; the masons' work by Messrs. Crabtree Brothers, of Keighley; the joiners' work by Messrs. John Ives & Son, Shipley; the plumbers' and glaziers' work by Messrs. S. Rushworth & Son, Shipley; the plastering by Messrs. T. Cordingley & Sons; the iron work by Mr. R. Hird, Shipley; the slating by Mr. Thomas Nelson, and painting by Mr. E. Harland, all of Bradford. Mr. J. S. Wilson was clerk of works.

The block of buildings at the top of the new street has been erected for Messrs. M. Rhodes & Son, goldsmiths and jewellers, and has an extensive frontage into Kirkgate, as well as into Bank-street and Queensgate. The window show-cases and internal fittings have been carried out by Mr. John Drew, of Hatton-wall, London. The masons' and joiners' work have been completed by Messrs. John Ives & Son, of Shipley, to whom much credit is due for the energetic manner in which these departments have been executed; the plumbing by Mr. John Davis; plastering by Messrs. Thomas Cordingley & Sons; iron work by Messrs. Cole, Marchant, & Co.; slating by Mr. Thomas Nelson; and painting by Messrs. Morrell & Hartley. Mr. John Wilson has acted as clerk of works.

The Liberal Club Buildings Company's premises, also those of Messrs. Parkinson, Clark, & Co., and Messrs. Rhodes & Son, have been erected from the designs of Messrs. Lockwood & Mawson.

Of a similar character to this block, both in regard to the style of architecture adopted and the purposes for which the new erections are to be used, is the block of shop and office premises now being erected upon the site of the old White Swan Inn and other property in Market-street, and of which Messrs. Milnes & France are the architects. The old White Swan premises, along with the adjoining shop property, and the whole of the land in the rear bounded by Charles-street and Brook-street, was lately purchased by Mr. Angus Holden, with the view of erecting a large number of shops, offices, and market-rooms. The new buildings will comprise altogether forty-four shops, forty-six offices, sixty-five market-rooms, and several warehouses. These are disposed in the three frontages to Market-street, Charles-street, and Brook-street, which enclose a quadrangle, wherein will be placed two blocks of shops and offices, separated from each other and from the outer buildings by arcades, which will be covered with an ornamental glass roof. These arcades are approached by four archways, closed out of business hours with iron gates. The style adopted is Italian, freely treated. Scoured ashlar has been freely used in the three frontages, and also in the walls of the arcade, the wall-spaces being covered with decorative tiles. The whole of the floors will be fireproof, and will be laid with tiles, cement mosaic, and cement concrete.

On the opposite side of Market-street is afforded another instance of a metamorphosis, in the new shops and offices erected by Mr. Parkinson, tobacconist. The building consists of three shops on the ground floor, and offices overhead, the latter being approached from the adjoining passage. The front elevation is of dressed stone, the style adopted being Italian. The contractor was Mr. T. Holliday, and the architects are Messrs. Knowles & Wilcock.

The second half of the new Kirkgate Covered Markets is making rapid progress, and will shortly be ready for occupation. When finished, there will be provided fifty-two shops and eighty-two covered and open stalls, or in all 134 separate tenements. The market will have a central level entrance in Darley-street, and a spacious entrance, with steps down, from Godwin-street and Rawson-place. A second dome, in the market roof, 50 ft. diameter, is being constructed over the latter entrance, to correspond with the one now at the Kirkgate entrance.

At the north-east corner of this market block of buildings, fronting into Darley-street and Godwin-street, and extending from archway to archway, the whole of the upper floors have been appropriated for the new Free Library. A separate entrance from Darley-street, and another from Godwin-street, give access to a noble staircase, 16 ft. wide, well-lighted, and by which the various rooms are approached. On the first floor will be the men's reading-room, 75 ft. by 37 ft. 6 in., extending up two stories, with a gallery round the same at mid-height, and lighted by a continuous lantern light. Another room, 92 ft. by 40 ft. wide, will form the women's reading-room, and the issue department or lending library. On the upper floor will be the reference reading-room — a noble apartment, 110 ft. long, 40 ft. wide, and 30 ft. high, lighted by side lights, and also by a continuous lantern light as before described. The building will be fireproof throughout in construction, on Fox & Barrett's system; and will be warmed and ventilated by Haden & Co.'s apparatus. The Corporation, on completing these works, of which Messrs. Lockwood & Mawson are the architects, will have finished the scheme of markets reconstruction, which has occupied several years to develope.

Mr. Geo. Thorpe, silk-mercer and draper, some time ago ago purchased ground fronting to Hustlergate and New Tyrrel-street, upon which he erected his wholesale warehouse, the site costing 23*l.* per yard. He also recently secured the adjoining plot, having frontages to Hustlergate, New Tyrrel-street, and Ivegate, with a view to the erection of a retail establishment, for which he gave the large price of 43*l.* per yard. The new premises are now completed, and with the wholesale warehouse, form a block which it is estimated has cost about 55,000*l.* In this case, too, the style adopted is Italian. Considerable ornamentation has been bestowed upon the principal retail entrance doorway, at the junction of Ivegate with Tyrrel-street. It is deeply recessed, the massive lintel being supported by short Doric piers upon highly ornamented brackets. The architects are Messrs. Hope & Jardine, of Bradford, whilst the contract for the works was placed in the hands of Messrs. John Ives & Son.

A commencement has been made towards the formation of the important thoroughfare from Sun Bridge to City-road, by the re-erection of the shops occupied by Mr. Newby, Messrs. Harrison & Parkinson, Dixon and Masser, &c. The architects are Messrs. Knowles & Wilcock.

The most recent example of warehouse architecture is the building erected by Messrs. Charles Semon & Co., in Bolton-road,—a new quarter of the town for warehouses,—but one possessing the advantage of easy approach. In this respect, this new district is much superior to "Germania," where huge merchants' warehouses are ranged high up the steep slopes of the hill extending to Barkerend. Messrs. Semon's new building is situated between New Commercial-street and Bolton-road, having frontages to Balme-street and the latter road. At the angle of the two streets is placed the principal entrance. The frontage to Bolton-road is 164 ft. in length. The style adopted is Italian. The architects are Messrs. Milnes & France.

The building now in course of erection for the Alexandra Hotel Company in Horton-road is sufficiently near the heart of the town for the convenience of commercial men, even judged by its distance from the Town-hall. A feature of importance will be the ample provision made for horses and carriages, thus supplying a want which in Bradford is now much felt. The principal building will be of brick faced with stucco. The architects are Messrs. Andrews & Pepper.

The new offices of the Bradford Poor-law Union are now approaching completion. The new building presents a plain, substantial appearance, and is Italian in style. The plans were prepared by Messrs. Andrews & Pepper.

Within a short distance of this building there is fast approaching completion one of the most notable erections of modern Bradford, namely, the new Friends' Meeting-house. The site of the old Meeting-house and burial-ground will shortly be required for the erection of the large railway station in Wakefield-road, and hence the Friends have had to seek a new location. The new Meeting-house and schools are being erected on a site fronting into Fountain-street and Brunswick-place. The style of the buildings is Italian. The outlay, exclusive of the site, will be about 14,000*l.* The architects are Messrs. Lockwood & Mawson.

In the neighbourhood of Manningham a cluster of almshouses is being erected in Whetley-lane by Mrs. Rand, in memory of her husband. The architects are Messrs. Andrews & Pepper. There are eight houses, each containing separate sitting-room, bedroom, and scullery.

THE YORKSHIRE ARCHÆOLOGICAL ASSOCIATION.

THE eleventh annual excursion of the Yorkshire Archæological and Topographical Association took place on the 29th ult., when the members and their friends visited Bolton Abbey, Skipton Castle, and Holy Church, Skipton. Special facilities for inspecting these places were afforded by the Duke of Devonshire and his agent, Mr. Cottingham; the Rev. C. Bellairs, M.A., rector of Bolton; Sir H. J. Tufton, owner of Skipton Castle, and his agent, Admiral Eliott; and the Rev. P. C. Kidd, M.A., rector of Skipton.

The carriage-ride from Skipton to Bolton was of much interest to the geologists of the party. The lofty escarpment known as the Skipton rock, from which limestone is supplied to a wide area, was passed to the right. Embsay Kirk, the original seat of the Augustinian canons, who were afterwards transferred to Bolton, now a private residence, lay to the left. Arrived at Bolton Abbey, the visitors were received at the

western entrance by the Rev. C. Bellairs, the rector, who, alluding to the interest attached to the abbey, said that fortunately it was possessed by a nobleman [the Duke of Devonshire] who preserved it with loving and watchful care. His Grace had in his possession the original compotus of the abbey, and documents containing many interesting particulars of the domestic life and affairs of the Cliffords. He trusted that his Grace might be induced to allow them to be published. Col. Brooke having thanked the rector for his kindly welcome, an inspection of the Abbey Church was made. Previous to this, however, the Rev. C. Bellairs drew attention to the stone screen erected by the Duke of Devonshire during the recent restoration, and which separates that portion of the abbey now used as a parish church from the ruined chancel. The transference from Embsay to Bolton Abbey took place in 1151, and it is stated that the Abbey Church occupied eighty years in building. As was the case with other priories of the Augustinian order, the church was associated with a parish church, the memory of which is preserved in the continued use of the present nave for Divine service. The following are the dimensions of the church: — Total length outside, 261 ft. 7 in.; length of nave (inside), 88 ft. 6 in.; length of transept, 121 ft. 5 in.; outside width of choir, 40 ft. 4 in.; of nave (inside), 31 ft. 3 in. There is no south aisle to the church. A tower originally stood over the transept, but this was subsequently replaced by the tower at the west end, which was in process of erection by prior Moon at the time of the Dissolution, and was never finished. A frieze along its north front bears this inscription:—"In the yer of our Lord MVCXX R ◡ (signifying Moon) begaun this fondacon on quho' sowl God have merci Amen." On the south side was the cloister court, chapter house, kitchen, brewhouse, dormitories, common house, probably a guest house, and other erections. These buildings extended considerably southward, and the site of a portion of them is now occupied by the rectory. The clear value of the possessions in 30th Hen. VIII. was certified as 238*l.* 15*s.* 1*d.* The house was surrendered by Richard Moon, the last prior, and fourteeen canons on January 29th, 1540, remained in the king's hands till April 3rd, 1542, when it was sold to Henry Clifford, first lord of Cumberland, for 2,490*l.* The visitors had, however, the opportunity of inspecting the excavations recently ordered to be made in anticipation of the visit of the association, and much satisfaction was expressed with the result, showing, as it does, many of the outlying foundations. Many of the basement courses laid open to view present (according to the *Bradford Observer*, from whose report we condense this account of the meeting) all the appearance of recently-dressed stone. The gate-house still remains on the west of the abbey, and with extensions on either side has been converted into a residence. The vaulted entrance, now closed at either end, forms the dining-room. During the last twenty years the interior of the nave of the church has undergone a complete restoration, the cost of which has been defrayed by the Duke of Devonshire. The six windows on the south side have been filled with coloured glass at an expense of 3,000*l.* The area has been filled with massive open oak seats. Stone pulpit, desk, and font have been provided, and the ancient rood-screen has been repaired, and placed at the west end of the building. The work of restoration has been completed by the removal of the unsightly wall at the east end of the nave, and by the erection in its stead of the new screen above mentioned. It is about 40 ft. in height and 30 ft. in width, and is divided into eleven equal compartments, with ornamental capitals, corresponding in design with the outer screen of the great west tower of the abbey. The major portion of the visitors having assembled in the ruined choir of the abbey,

Mr. J. T. Micklethwaite, F.S.A., described the various remains of the conventual buildings, and pointed out their architectural features. He especially noticed the peculiarity that the church had but one aisle, and showed that this was not a caprice, but was the legitimate consequence of the conditions under which canons' churches were erected. In this respect parish churches differed from monastic churches, which were large, comfortable buildings with aisles. Parish churches as first built were sometimes cruciform, and sometimes without transepts, but in either case they were aisleless; and if there was a tower it was in the centre of the edifice. The canons adopted the cruciform style, which was the finer type of parish church, and glorified it by making it larger, but still kept to its characteristic want of aisles. Mr. Micklethwaite then analysed the construction of the church at Bolton, attributing the aisle to the early part of the thirteenth century, and the rebuilding of the choir and transepts to the fourteenth century. Reverting to the question of central towers, he explained that the reason why they came to be erected at the west end was because they were invariably additions, and it was more convenient to enclose a piece of outlying land than to pull down and re-erect the entire structure. The tower at Bolton was an illustration. It was begun in 1520, and after thirty years had elapsed, had only reached the elevation which it now presented. This also showed the slow process adopted by the early church-builders. He then referred to the use of the naves of old churches for service, as illustrated by the church at Bolton, the piscina and sedilia being still preserved on the south side of the present altar. Reference was also made to the positions of the remainder of the monastic buildings, the chapter-house, the dorters, refectory, guest-house, &c., and took occasion to thank the Duke of Devonshire for the work of excavation undertaken in anticipation of the meeting, by which several interesting points had been cleared up, and which had enabled them to prepare the most complete plan of the abbey buildings yet produced. The reading of the paper concluded, the company strolled round the ruins, Mr. Fairless Barber and Mr. Micklethwaite explaining the former positions of the dismantled buildings.

On arriving at Skipton, luncheon was partaken of in the town-hall. Before departing for an inspection of Skipton Castle, the next item upon the programme, Mr. Leader proposed the toast, "Success to the Yorkshire Archæological Association," especially eulogising Mr. Fairless Barber, who, he said, was the life and soul of the society. His zeal and powers of organisation had been as apparent in the success of that day's excursion as it was in the ordinary working of the Association. Mr. Barber, in response, said that the financial position of the society was most satisfactory, their treasurer having over 600*l.* to the good.

The company then placed themselves under the guidance of Mr. A. W. Morant, F.S.A., who read a paper on the history of Skipton Castle, and its possessors. Skipton Castle is situated on the edge of a limestone cliff, which is very precipitous and picturesque. As a place of strength it became almost a necessity to defend the town of Skipton, which in early times was of some importance, and its position, commanding the road through Airedale and the one leading to Wharfedale, was especially well chosen. The associations of the castle, however, are of even more interest than attaches to its position as a stronghold.

The remaining place of interest visited was the Church of the Holy Trinity, closely adjoining the entrance to the castle. Of the first church, probably coëval with the Norman castle, no traces remain in the present fabric, the earliest portions of which are referable to about the year 1300. The parts of the church of this date which remain consist of a north door, the six westernmost piers in the nave, portions of the tower and a part of the south wall, in which sedilia are still preserved. The church was extended and altered to its present form in the following century. The roof, which is of carved oak, was restored in 1853 by Mr. J. A. Cory. The church contains some fine monuments of the Cliffords, and at the west end is a small but valuable library, bequeathed by Sylvester Petyt, which is in a sadly-neglected condition. Mr. Fairless Barber, Mr. Morant, and Mr. Cory, having explained the distinguishing features of the building, the excursion was brought to a close.

Tynemouth Aquarium and Winter Garden.—The building for the Tynemouth Aquarium and Winter Garden is now far advanced towards completion. The entire length, with two long wings on the north and south, is 309 ft. 9 in., and the width at the wings is 117 ft. The extent of the aquarium, which occupies the whole of the basement of the main building, is 216 ft. by 50 ft., the width at the transepts being 82 ft. Adjoining and running the whole length of the aquarium on the east side there is a spacious arcade, intended to serve as a promenade. The winter garden, which is of the same dimensions as the aquarium, will be roofed with iron and glass, and will also be lighted from the east and west sides.

THE OBELISK AND ITS PEDESTAL.

SIR,—I perfectly agree with Mr. Barry's objections to the Parliament-square site for the obelisk, and with his observations on the "abstract necessities for a good site for the monument"; but his alternative recommendation and conclusion do not seem to me to be so unexceptionable.

Of the many sites suggested, the front of Greenwich Hospital has much in its favour, but the distance from London is an insuperable drawback. The objections to the area in front of the British Museum apply in even a greater degree to the Park-crescent site, for instead of one mile of land transit, there would be more than two miles along the line of and crossing a complicated system of underground works, and for what? to place the monument at a spot without association or interest of any kind past or present, and entirely out of the way of the student or sightseer,—in effect, getting rid of it. Isolation for this solitary ancient monument seems to me to be an indispensable condition: indeed, in one sense it is forced upon us, for obelisks were invariably placed in pairs in front of the gate of the temple, and here the companion is wanting. The site which I should recommend would be the extensive area in front of Buckingham Palace, in the line of the broad avenue leading up to the centre of the Palace, a spot from which it could be seen from St. James's and the Green Parks, Piccadilly, and other points, without interruption or inharmonious surroundings; while the distance from the river is not great, and the practical difficulties of transport would be few. If, however, a place on the Embankment, or in its vicinity, is considered essential, then the Northumberland-avenue site would appear to be the best. It presents fewer practical difficulties, is easy of access, and affords greater surrounding space than could be found elsewhere, as the depth from the shore line to the buildings is greater than at any other part of the Embankment. The monument would be seen from Trafalgar-square and from the river; from the Embankment and from the bridges; while it would be isolated by a considerable space around. The objections to the site are the lofty railway station and bridge; but these, although near and not handsome works, present at least horizontal lines, and thus coincide with the general laws applying to such monuments and the buildings connected with them, instead of contrasting disadvantageously with vertical structures of far greater height. The obelisk as a pillar is not large when compared with spires or similar structural works; but as a monolith nearly 70 ft. high it is grand, and should not be dwarfed by unfavourable juxtaposition.

It may not be inopportune to offer a few words respecting the pedestal. I have seen, I think, all the obelisks that now remain, and have no hesitation in concluding that every obelisk had a base of some sort. The great obelisk at Karnak, 95 ft. high, is still standing on its pedestal. The pedestal is a single cubical block of granite, bearing an inscription of eight horizontal lines of hieroglyphics on each of its four sides (published in Burton's "Excerpta Hieroglyphica"). On the staircase of the British Museum is a cast of the Apex, or Pyramidion, of the companion obelisk which lies broken in pieces by its side. There were originally four obelisks standing in front of the temple, two being of much smaller dimensions; one of these is still on its pedestal, which is so entirely covered with *débris* that it has never been seen. The obelisks of Luxor each stood on a cubical block of granite, the north and south sides being sculptured in Egyptian low relief, with four Cynocephali in the attitude of adoring the sun. On the east and west surfaces are figures of the god Nilus bearing the productions of Egypt. This block stands on two steps. The obelisk of Matarieh, ten miles north of Cairo, is still standing on its base, which, when uncovered a few years ago, was found to be mutilated. Mr. Dixon has excavated the base of the obelisk still standing at Alexandria, the companion of that which he is bringing to England, and found it to be supported on four crabs or tortoises, which may have furnished the idea to the architect Fontana, who placed the obelisk he erected in the Piazza San Pietro, at Rome, on four small bronze sphinxes between the monolith and the base.

When the Nelson Monument was proposed, the late Owen Jones sent in a plan for re-erecting the Alexandrian obelisk on the site in Trafalgar-square now occupied by the Nelson column, and

he designed a pedestal, placing at the base eight sphinxes, in pairs, two on each side. This drawing I have now before me, as well as another equally curious, made by John Martin, the painter, more than fifty years ago. It is a design for a triumphal arch in honour of Wellington, and was proposed to be erected across the Marylebone-road, to serve as a means of communication between Park-crescent and Park-square.

In conclusion, the subject of the site of the obelisk is well nigh exhausted; but amid the numerous opinions and suggestions that have been broached, there is yet one conspicuously absent—it is that of Mr. Erasmus Wilson, whose munificence has originated the prolonged controversy.

JOSEPH BONOMI,
Curator of Sir John Soane's Museum.

SIR,—The purpose of the obelisk in art is that of a foil or contrast to architectural proportions of a ponderous and opposite kind. To place one, therefore, in the immediate neighbourhood of architectural features of its own kind, and of far greater *absolute* magnitude, in the position, in fact, which the pattern now occupies, surrounded by the lofty towers and buttresses of Westminster, would be to misapply it, and to deprive it of its proper effect.

The absolute dimensions of the *Needle* as an architectural feature are insignificant items in the consideration; what are they to those of our factory-chimney obelisks rising to hundreds of feet?

The one great point to be steadfastly kept in mind in beating about for a site for the celebrated monolith, is this,—that it should be placed in opposition to architectural proportions of an opposite tendency to its own. The sites which suggest themselves to me, as those which would be most appropriate are, the place of the statue of Queen Anne, opposite to St. Paul's, the ground in front of either the British Museum, or of University College, the esplanade at the back of the Horse Guards, the front of Buckingham Palace, and the centre of the roadway between the gates at Hyde Park Corner. With all due deference to Mr. Barry's suggestion, I feel that at the end of Portland-place it would be ruined by the magnitude of the vista. If placed opposite St. Paul's it would fulfil the same architectural purpose as the obelisk does in front of St. Peter's, and it would gratify those spirits who are striving to make our Protestant cathedral as close a copy as possible of the great Roman edifice. But first catch your obelisk.

SPHINX.

*** We willingly "ventilate" the question, but adhere to our original opinion that the Thames Embankment offers the best site to the obelisk.

"MONASTIC BUILDINGS."

TINTERN ABBEY.

THIS was the title of a paper read by Mr. Thomas Blashill, at Tintern, a few days ago, on the occasion of the visit of the Woolhope Naturalists' Field Club. Tintern Abbey, said the lecturer, was a house of that branch of the Benedictine order known as Cistercians or White Monks. It was founded in 1131 by Walter de Clare, who, becoming possessed of a vast extent of country, including Monmouthshire, followed all the great nobles of his time, in settling a small part of his possessions to religious uses. The Cistercian order had only been established in 1098, and confirmed by Pope Pascal in 1100. St. Bernard, to whom it owed its great celebrity, joined it in 1112; its first house in England was founded at Waverley in 1128; Tintern was therefore one of the first evidences of the power to which the order so suddenly attained. Of the monastic buildings then erected nothing remains, unless the north wall of the nave is in part of that date; but no sculpture or moulded stone has survived for proof. Whether or not these monks suffered the vicissitudes common to the earlier houses of their order, we may be sure that rigid plainness characterised their buildings, as voluntary austerity marked their life. The existing building owes its foundation to Roger Bigod, Earl of Norfolk, a descendant of this branch of the family of de Clare, and owner of their lands, who, in 1269, caused this work to be begun. The church was finished in 1288, and it stood in its glory for two centuries and a half till the dissolution of the monastery in 1537. It thus became one of the later examples of the Cistercian buildings; for long before the dissolution monasteries had ceased to be newly constructed, although in 1496, only forty-one years before that catastrophe, the monks were partially rebuilding their cloister and the quarters of the prior. They were thus but indifferent prophets of the future, and this last work shows by its magnificence that they were then but indifferently austere. But these buildings of 1269 were undertaken in what most persons will think the happiest moment of the history of English architecture. It was the very year in which the new choir and transepts of Westminster Abbey, built by Henry III., were opened. It was just at the time when the graceful simplicity of the Lady-chapel of Hereford Cathedral had developed into the richer style,—especially as regards the windows—of the great north transept. The beauty of the mouldings, the elegance of the outlines of the thirteenth century, are preserved; the purity of its carving not quite lost; the glories of the fourteenth century tracery are anticipated; while there is a reserve of fancy, a grand uniformity which hardly any other building of its age can rival. As to its character as a ruin (pity that it should be a ruin), I can point out nothing which every lover of the picturesque will not see for himself. In that quality it is clearly unequalled amongst our monastic remains; and whenever people talk of scenes which have afforded them the fulness of delight, this romantic valley, these graceful outlines and sweet tints of stone and foliage, yon broken eastern window—across whose solitary mullion the rising moon will, three nights hence, shine round and broad—are first and last remembered. Having given a long and interesting outline of the origin and usage of monastic buildings generally, Mr. Blashill described in detail the buildings at Tintern, and concluded by briefly referring to the buildings erected by the other monastic orders.

STATE AID TO SCIENCE AND ART.

MR. WARRINGTON WOOD, the sculptor, was entertained at dinner by the members of the Liverpool Art Club on the 7th inst., in connexion with the opening of the Walker Art Gallery. Lord Sandon was one of the speakers, and in responding to a toast with which his name was coupled, alluded to the great difficulties in the relationship of the State to science and art. When he looked at the toast list he saw that it gave the toast as the "National Recognition of Art," which was a very different thing to the Government recognition of art. He would venture to say that what he saw that day and the previous day confirmed him in the opinion that he had long entertained, and which he intended to cling to—namely, that the nation was recognising art with heart and soul as far as it could. He put aside Government recognition, because that evidently had dropped. They saw that the nation was very willing and most earnest to recognise art, and reward those who were the priests of art in the highest way that they could by approbation, and in some solid manner; but it was a serious question how far it was wise for the Government of the day—that was, those who had charge of the national exchequer—to expend the national resources in supporting art. There was no Minister at the present moment who represented science and art in the country. [A voice—"There ought to be."] He was thinking just then what a very serious matter it would be if they had a Government of the day with one of its representatives charged with so grave and responsible a thing. Let them think of the different schools of art, and the different classes of art, of the different divisions in science, and of all the different towns that would try and struggle for the patronage of the Minister had he the funds to dispose of. Let them think of the Minister of the day who should throw the whole scale of his influence on one side of art, who took the mediæval or classical view, and let them think of the perplexities that would throng round the Government in its distribution of that patronage. One Minister might be devoted to the rising school, another strongly devoted to the school said to be past its date. He thought they would sympathise with the political difficulties that thronged the career of every Government, but he looked with more apprehension to the difficulties that would throng round the Minister, who would be submitted to the criticism and intellect of those who were trained in science and art. While he was heartily glad of the amount of assistance they were able to give through their great organisation at South Kensington; while he rejoiced to think that they were aiding in training the lower portions of the population who had the talent to fit them for the very highest positions, he doubted whether it would be wise for the Government to go further. He trusted very much to the higher impulses of all great communities which led them like Liverpool to spread all that was high and lofty in sculpture, art, and science; and, in his opinion, they gained much more by the freedom and originality which left matters to the community in an English fashion than they would gain by the more rapid advance they might get by Government support. He had yet to learn that the support of the State had ever produced artistic genius or success. He was quite aware that individual patronage—and he did not use the term in a disagreeable sense—had been of very great value; but he looked in vain for any great result produced by State patronage either in the present time or in the past. He hoped, therefore, that they would adhere to the English habit of trusting to individual exertion, and that as time went on they would prove that they had not trusted to a broken reed, but to one that would prove itself to be the very staff and support of the nation.

THE ABERDEEN CONGRESS OF SOCIAL SCIENCE.

THE order of proceedings and the general arrangements for the Aberdeen Congress are just now completed.

In the early part of the first day of the Congress (Wednesday, the 19th inst.) a joint meeting of the committees of departments will be held, and also a meeting of the council; a special service will take place in the West Parish Church in the afternoon, at which the Rev. Professor Milligan, D.D., will preach. In the evening the Earl of Aberdeen will deliver his inaugural address.

On Thursday morning Lord Gifford will deliver his address on "Jurisprudence." The meetings of departments will follow, for the reading and discussion of papers; and in the evening the Lord Provost and the magistrates and town council will entertain a large party at dinner in the Town-hall.

On Friday the Right Hon. Lord Young will deliver his address on "Education;" the discussions will be continued; and in the evening there will be a *conversazione* in the Advocates' Hall and County Buildings, at which Lord Ronald Leveson-Gower will deliver his address as president of the art section.

On Saturday the Lord Advocate will deliver his address on "Repression of Crime;" after which the departments will sit; and in the afternoon there will be excursions to Dunnottar and Aboyne, and possibly other places.

On Monday the proceedings will commence with the delivery of an address on "Health," by Mr. Edwin Chadwick, C.B. In the afternoon, after the discussions, a visit will be paid to the Old Mill Reformatory, under the able guidance of Mr. Sheriff Thomson; and in the evening there will be a working men's meeting.

On Tuesday Mr. James Caird, C.B., M.S., will deliver his address as president of the Economy department; the sections will proceed with the discussions; and in the evening a *conversazione* will be given in the Music-hall.

On Wednesday, the last day, a meeting of council will precede the concluding meeting, at which the address of the president of the council (Mr. G. W. Hastings) will be delivered, and a report on the business of the departments will be presented. In the afternoon excursions will be made to places of interest in the neighbourhood.

Test of Cements. — In Berlin the Royal Society of Engineers has lately made 3,150 tests of cement mixed with different proportions of sand. Blocks measuring 4 in. by 4 in. by 2½ in., which had hardened for ninety days, were subjected to pressure, with the following results:—Pure cement, average pressure at which first crack appeared, 4,125 pounds; average crushing pressure, 4,708 pounds. Equal parts of cement and sand, first crack appeared under an average pressure of 3,058 pounds; crushed by an average pressure of 3,527 pounds. One part of cement to two of sand, first crack appeared under an average pressure of 2,375 pounds; crushed under an average pressure of 2,773 pounds. One part of cement to three parts of sand, first crack appeared under an average pressure of 1,849 pounds; crushed under an average pressure of 2,375 pounds.

STOKE-UNDER-HAM, ILMINSTER.

THE south transept of this very interesting church has been lately repaired at the sole cost of Mr. John W. Walter, of Stoke-under-Ham, as a memorial of Mrs. Walter. The walls internally have been cleaned of the yellow ochre and white-wash with which they were covered, and have been pointed. The transept has been re-paved and re-seated with solid oak benches in character with the Mediæval ones existing in the nave of the church. A new panelled ceiling of English oak, with carved bosses, replaces a modern flat lath-and-plaster ceiling. All the windows (which are lancets of Early English date) have been filled with painted glass, the production of Messrs. Heaton, Butler, & Bayne.

The work described is only an instalment of what is proposed, i.e., the complete reparation of the nave, chancel, and north transept (under the tower). One of Porritt's underground stoves in a proper chamber has been placed in the nave, and an ornamental chimney-shaft carried up in the angle of the south transept and nave. The cost of this has been borne by subscription. The formerly handsome oak ceiling of the nave was almost destroyed in Georgian times, but the whole of its design can yet be traced. Mr. Maurice Davis, of Langport, was the builder, and Messrs. Benjamin and Edmund B. Ferrey, were the architects.

NEW DRINKING FOUNTAINS.

Kew.—On July 26th H.R.H. the Duchess of Teck opened a drinking-fountain and cattle-troughs at Kew-bridge. The structure was designed by Mr. R. Keirle, the architect to the association. It consists of polished grey granite, and stands about 30 ft. high. The fountain is approached by a flight of four steps on two sides, and on each of the other sides is a large trough, &c., with a lower one for dogs. The fountain was presented to the Metropolitan Association by Mrs. Wheeler, of Chertsey, in memory of her late husband.

London.—A new drinking-fountain is about to be erected by the authorities of Broad-street Ward, which is intended to supply the place of the pump in Bartholomew-lane, the use of which was interdicted by the Commissioners of Sewers on the recommendation of the medical officer. The Bartholomew-lane site being too circumscribed, the commissioners sanctioned the erection of the fountain at the northern end of the eastern Royal Exchange avenue. In the design adopted the lower part of the fountain is (according to the *City Press*) of Penryn granite of different tints, and polished. (The contract for this will be entrusted to Messrs. Freeman.) Upon this base, supported by coupled columns at each angle, is an ornamental canopy to protect a group of sculpture; this will be wholly of bronze, picked out with gilding. (This part of the design will be entrusted to Messrs. Hart, Son, & Peard.) The group of sculpture, consisting of three figures, has been modelled by Mr. S. Dalon, Chelsea. The architect is Mr. J. S. Edmeston, Great Winchester-street. The cost of the marble group will be 300*l.* The Drinking-Fountains Association have agreed to supply the hydraulic work, set up the fountain, and form the drainage, which is probably equal to a donation of 50*l.*

St. Pancras.—On the 22nd ult., Mr. William Thornton, senior churchwarden of St. Pancras parish, publicly presented an iron drinking-fountain to the vestry, on behalf of the parish. The fountain, which has been erected in the St. Giles-in-the-Fields portion of the grounds, has been provided at the sole cost of Mr. Thornton.

Bridgnorth.—The Town Council have approved of the tender of Mr. Griffiths, of Bayswater, for the public fountain to be erected as a memorial to the late Mr. Whitmore, who formerly represented the borough in Parliament. Mr. R. Herbert Carpenter is the architect. The fountain is to be erected in Aberdeen granite, surmounted by a bronze figure of Sabrina, the goddess of the Severn. Bronze medallions will enrich the four sides of the pedestal.

Windsor Castle.—Workmen have just been engaged in laying mains in the cloisters and near the north side of St. George's Chapel, Windsor Castle, in order to provide a sufficient supply of water in case of fire. The new system has been connected with the service in the Castle-hill, which is supplied with water from Cranbourne, and hydrants will, it is understood, be erected in the cloisters and about St. George's Chapel.

ACCIDENTS.

ON the 3rd inst. a terrible accident occurred at Warrington, resulting in the death of two or three children, and in injuries of a serious character to several others. About half-past six o'clock in the evening a cupola chimney, belonging to Messrs. Bolton, Son, & Wood, of Oxford-lane, fell into a street in which scores of children were playing.

On the 25th ult. a master plasterer, named Charles Edwards, carrying on business in the Old Kent-road, met with a fatal accident at some new buildings at Rotherhithe. Having reached the top round of a ladder, he attempted to step on to the scaffold, and in so doing his foot slipped, when he fell to the ground, and received such severe injuries that he died almost immediately.

Mr. Payne, the coroner for Southwark, has held an inquest at Guy's Hospital relative to the death of W. T. Bessell, aged seventeen. The deceased was at work pulling down a house, No. 60, Gravel-lane. He was warned that a wall between 5 ft. and 6 ft. high was going to be pushed down, and he replied "All right, I'm clear." The wall was then pushed down, and just as the wall was falling deceased had discovered that his coat was lying under the wall and had tried to secure it before the wall fell. He, however, was knocked down and his head was buried under the *débris*. When extricated he was removed to the hospital, but was found to be dead. Verdict: "Accidental death."

On the 30th ult. an inquest was held before Mr. Price, coroner, at Patricroft, on the body of Selina Rogerson, who met with her death through the fall of a "derrick" upon her at some shops in course of erection in Liverpool-road. The evidence went to show that deceased had had her skull fractured through the injuries she received. The jury complained of the unprotected state of the building, around which the builder had erected no hoarding. A verdict of "Accidental death" was returned. The jury also passed the following resolution: "That the two men, named Barnes and Thorley, be censured in having taken the poles down in a negligent manner, and without sufficient care; that Messrs. Speakman, the builders, are to blame in not erecting a hoarding round the building to protect the public; and that the Eccles and Barton Local Board be impressed with the necessity of carrying out and enforcing their building regulations with regard to all buildings, and that they strictly enforce the regulation requiring hoardings to be placed round buildings in course of erection."

On the 16th ult. one of the hydraulic swing bridges at the west entrance of the Morpeth Dock, Birkenhead, was being opened for the purpose of being cleaned, and when about midway it broke in two, one portion of the structure falling into the dock. Fortunately there was no one on or under the bridge at the time. The bridge is worked on a "ram" by hydraulic power, and was constructed about ten years ago by Sir W. Armstrong. The structure is 140 ft. long by 27 ft. wide, and was built at a cost of between 3,000*l.* and 4,000*l.*

MASTERS AND MEN.

Manchester.—The nineteenth week of the joiners' strike has been completed, and the struggle still continues. The men have issued a circular in which they refer in no delicate way to the action of the masters' association in seeking men in different parts of the United Kingdom, on the Continent, and in America, and state that of the 4,000 men who struck work on the 1st of May, 650 now only remain on the books; and of the 400 non-society men, 150 only remain. At a meeting of the Associated Masters on the 28th ult., it was reported that men were coming into the district in search of work in larger numbers than at any previous period of the strike, and the employers were quite sanguine of having the full number of men they require very shortly. A deputation from the workmen's strike committee waited upon the employers, their object being to see if the employers would enter into negotiations with the committee. The employers replied that they declined to meet the committee, and remarked that the shops were open at 8½d. per hour, but on no other terms. Twenty-five joiners for Manchester arrived from New York on the 7th inst. by the Guion steamer *Wisconsin*. Their fares were advanced, and three years' employment guaranteed to them, at wages equalling $3½ per day in New York.

The Clyde.—A fortnight ago, when the masters agreed to arbitrate on the present dispute, it was thought that the men would immediately resume work. This the shipwrights refused to do until a basis for arbitration had been agreed upon. The masters, on the 30th ult., sent a note to the shipwrights, requesting that five delegates from the men should meet a like number of masters to arrange the basis of arbitration, the men meanwhile resuming work. On the evening of that day, however, at a largely-attended mass meeting of shipwrights, it was unanimously resolved not to accept the masters' proposal until the basis of arbitration had been agreed upon.

Newton Abbott.—The wages dispute between the master builders and the masons of Newton Abbott has terminated. The masons are to receive their demand of 6d. per hour, and all sub-contracts are to be abandoned.

Motherwell.—About three months ago the master joiners of Motherwell intimated to the men that after the expiry of three months they would not bind themselves to abide by the bye-laws and rate of wages then in force. Subsequently they submitted a revised code of bye-laws and rate of wages for the consideration of the men. The latter have responded by formulating a counter code of bye-laws. The employers' notice expired on the 25th ult., and the men came out on strike. The masters of the districts of Motherwell, Hamilton, and Blantyre, are making arrangements to adopt the same rules and rate of wages.

THE MASONS' STRIKE.

SIR,—I cannot see the force of the arguments based on the number of houses built in London in a year. It does not follow that because the number of houses built in 1876 exceeded that of previous years the number built in 1877 will be greater. Possibly too many may have been built in 1876, and the number built in 1877 may be much less, especially as bricks are so dear and the masons are trying to further increase the cost of building. The number of houses built comprises a very large number of small houses, in which hardly any stonework is used; moreover, concrete and terra-cotta are, to a great extent, taking the place of stone, so that the number of houses built can be no criterion as to the quantity of stonework used. One great argument for a rise in wages would be the increased cost of living; but I find that many articles of necessity are decreasing in price, especially coals. I have not bought coals so cheaply as I have done lately for very many years.

A READER.

THE POLITICAL ECONOMY OF THE SEWAGE QUESTION.

SIR,—You will think me persistent in writing on this subject, but I cannot give over without trying to say another word in favour of schemes for utilising sewage. There is a sentence in the last number of the *Builder* (Sept. 8) to this effect,—"The idea of value to be obtained when the main object is nuisance to be destroyed, has been perhaps the most prolific source of all the delay, waste, and misconstruction that has up to this moment so fatally retarded the sanitary engineer." Now, looking back fifty years, we find that it was neglect of utilisation which was the very root and propagator of the evils now sought to be removed,—these evils, caused by this neglect, grew and spread for twenty-five years, till they assumed alarming proportions. The idea of recovering the value and purifying sewage water by filtration was then started, and, since that, it has been misapprehension and misconstruction with regard to the particular *method* of utilising which has caused much delay. There has been a general desire that the utilisation should be carried out in its most perfect form; but amidst misapprehension, misconstruction, and bungling, the idea itself survives and grows in strength and importance.

The other idea of trying to simply get rid of sewage, and be done with it for evermore, has been tried in practice, has been tried a long time, and has not only failed, but the longer practised grows the more hopeless. We know of no other *safe* method for the disposal of sewage but by its utilisation. Had earth and dry closets come into general use when water-closets were introduced, the pollution of rivers would not have assumed the proportions that it has done.

Next, with regard to the comparative value of the commodity. It is valuable to the farmer, and it is better to give it to him for a trifle, or for nothing, than throw it away.

Commodities we do not ourselves require, as, for instance, old clothes, we sell for what they will bring in the market, and let them go; the party who buys is a direct profiter by the transaction, we are no loser, and the wealth of the nation is increased a little,—however little. The stable-keeper sells the manure of the stable for what it will bring, and would never think of destroying it as long as he could get any one to cart it away for him. In like manner, the magistrates of towns dispose of the sweepings of the streets; and why any one should oppose the economic view of the sewage case I fail to see; it seems like infatuation.

WILL. H. BLACK.

MODEL LODGINGS.

SIR,—I observe in the *Builder* of the 8th inst. an anonymous letter purporting to be from a "Working Man," in which certain statements are made with respect to "the premises now erected by the 'Improved Industrial Dwellings Company.'" I think no one can read that letter without feeling that the allegations contained in it are exaggerated, and I need only state that they have no foundation in fact. With nearly 3,000 dwellings in various parts of the metropolis, accommodating nearly 15,000 persons of the working-classes, something will, of course, occasionally go wrong; but no complaint is ever made to the company which does not receive immediate attention. The best evidence I can offer of the appreciation of the efforts of the company by the working-classes is the fact that the demand for the dwellings is always greatly in excess of the supply.

JAS. MOORE, Secretary.

"DESERVING REWARD."

SIR,—Under this heading you report in the *Builder*, p. 890, an act of great courage which *does* deserve reward. I enclose 5s. in stamps, which I should have sent direct to the builder, were it not that I think that if you opened a subscription for the brave man it would prove an encouragement to other good fellows whose worthy deeds are often unnoticed and unrewarded.

The *Builder* is the *Times* of its kind, and I feel sure that, by imitating the example of the great journal and appealing to an appreciative public, you will add another claim to the favour and patronage of English readers in the building and architectural line. P. E. CHAPPUIS.

*** We have received the 5s. mentioned. Mr. Godwin adds 5s., and we will wait a week before forwarding the amount, in case any other admirers of pluck shou'd desire to add to it.

THE CHAPEL ROYAL, SAVOY.

SIR,—During the last week remarks have been made by most of the daily and weekly papers in reference to the alterations about to be carried out in the above building, and as some fears have been expressed lest the ancient character of the edifice should be injured, we have thought it right, as architects to her Majesty for the works, to inform you explicitly what their nature is.

The existing vestry, which dates back only some five-and-twenty years, and which, beside being too confined for the necessities of the choir, is defective in its sanitary arrangements, will be removed. In place of it, and on the same site, will be erected a new vestry, more in accordance with the character of the chapel and in no way interfering with the view of the east elevation.

A new, small doorway is to be cut through the east wall by the pulpit, not, as stated by one paper, to be an entrance solely for the Chancellor's use, but chiefly to form, what is so much needed at the north end, a vomitorium for the congregation in case of fire. Before this door will be a porch which will also give access to the new vestry.

These are the only works now definitely arranged, for the scheme for raising the organ into a loft at the south end, and forming doors in the south wall, towards the Embankment, in place of the present modern east door, is postponed for further consideration.

PERRY & REED, Architects to
Her Majesty's Chapel Royal in the Savoy.

CEMENT KILNS.

SIR,—In reply to Mr. V. De Michele's letter relative to what I stated in the *Builder*, as to the tunnel flue system for drying the slurry with the waste heat from cement-kilns, it was when I was employed in the erection of cement works at Greenhithe, under the tunnel flue system, that I made by my own notion the improvement I claim, viz., in the improved formation, by constructing the flues at the back end, to bring the heat to play more fully and directly over the slurry, and that was on the 3rd of November, 1873. Moreover, the ventilating holes through the crowns were never thought of until I myself adopted the plan. These holes were introduced for two reasons: 1st, if the gases were to ignite suddenly in the tunnels, they would perhaps blow both loading holes out at front end and back end. These ventilating holes are simply a safety-valve should the gases blow and give vent, instead of allowing the gases to blow out the end load holes; so you see I am quite aware that there are ventilating holes in the crowns; also, I am aware that the heated gases have been brought to the lowest point in the tunnels for some time, viz., since the kilns were first lighted up, but Nov. 3rd, 1873, would be some time ago.

W. MAY.

CHURCH-BUILDING NEWS.

New Shoreham.—The parish church of New Shoreham was re-opened on the 27th of June, after restoration under the direction of Mr. Arthur Loader, architect, Brighton. The Bishop of Chichester, in the course of a sermon delivered on the occasion, referred to the controversy which took place in our columns and elsewhere as to the manner in which the architect was dealing with the building. His lordship said:—"We have here but the remains of a far greater building; the green mounds show how it extended westward. Happily, the more beautiful part of the building, the choir, remains to us. This it is which, so far as we are allowed, has been carefully and tenderly repaired, and I bear willing witness to the scrupulous piety with which the whole work has been carried on. It has not been the purpose of those connected with it to substitute some better thing of their own invention, but rather to reproduce with exact fidelity what originally existed; to trace out and recover the ancient plans, so that the church might again stand complete and unmutilated as it came from the founder's hands. This is the principle of the work; how it has been executed you can all judge. This was the idea of the architect, and I believe it to have been as truly conceived as it has been successfully realised."

Netherhampton.—Netherhampton Church was lately re-opened, after undergoing restoration, to an extent almost tantamount to entire re-building; for, with the exception of the lower part of the tower, and one or two windows, nothing of the original structure remains. The work of rebuilding was commenced in the summer of last year, Mr. Butterfield, of London, being the architect, and Messrs. Hale & Sons, of Salisbury, the builders, Mr. W. Cowley acting as clerk of the works. The total cost, including fittings, has been about 1,900*l.*, towards which the Earl of Pembroke has liberally contributed upwards of 1,500*l.* The style of the new church, which is constructed to seat a congregation of about 110 persons, exclusive of those in the chancel, is Decorated. The tower has been raised some 10 ft., and is surmounted by a steeple covered with oak shingles, which are also used to cover the roof. The outer walls are of brick faced with flint and Tisbury stone, Bath stone being used for the quoins and dressings.

Buckland Monachorum (Devon).—The foundation-stone of a small church for the hamlet of Milton, in the parish of Buckland Monachorum, Devon, and dedicated to the Holy Spirit, was laid, with a special service, on July 24th. The building is to consist of nave, 37 ft. 6 in. by 20 ft.; chancel, 20 ft. by 15 ft.; vestry, and west porch. The style is Early English, the materials being local stone, with Roborough Down stone quoins, and dressings of Bath and Ham-hill stone. There is to be a lofty stone bell-turret at the west end. The nave is to accommodate about 114 in chairs, the chancel seats to be wainscot oak, also the altar and rail. The cost of the building, including the purchase of the site, is to be about 1,100*l.*, undertaken by the Rev. R. J. Hayne, vicar of Buckland Monachorum. The contractor is Mr. Blowey, of Buckland; the architect is Mr. Ashworth, of Exeter.

Porton.—The new edifice, called, as was the ancient structure in place of which it was erected, after St. Nicholas, is built in the Decorated style of architecture. It was designed by Mr. Pearson, of Harley-street, London, and built by Mr. Grace, of Lower Wallop. It is built of flint, with stone at the angles and in the buttresses, and in the chancel there is an altar-rail of scrollwork, fitted up with beaded bands of wrought iron, the work of Mr. C. J. Tutt, ornamental ironworker, Salisbury. The site on which the edifice stands, and the little churchyard around it, were given by Mr. J. Ingram, of Wylye.

South Teal (Devon).—The hamlet of South Teal, in the parish of South Tawton, Devon, has had its old chapel restored. Hitherto neglected and dilapidated, the old granite structure, dating from Tudor times, had of late years been used as a school. Through the care of an old resident, and under the direction of the Rev. J. Bliss, vicar of the parish, the building has been newly roofed in red deal, granite windows have been inserted, and the interior, about 35 ft. by 13 ft., restated. The sacrarium has a tiled floor, and the altar is of English oak. Three figures in stained glass,—the Crucifixion and the two Marys,—occupy the east window. The vacant arch of the turret has a new bell, in unison with the old one. The granite work and masonry have been executed by Mr. John Aggett, of Chagford; and the woodwork, &c., by Mr. Underhill, of the same place, Mr. Ashworth, of Exeter, being the architect. The chapel was opened by a special service on the 17th of July.

Tonbridge.—The concluding service in the old parish church of Tonbridge, prior to restoration, virtually amounting to rebuilding, has been held. The contract for the work has been taken by Messrs. Punnett & Sons, Tonbridge, for a sum of between 8,000*l.* and 9,000*l.*, which does not include reseating nor the restoration of the tower.

Corwen.—A small vestry has recently been added to the east end of the south aisle of Corwen Church, North Wales. Previously the church possessed no vestry at all. The designs for it were furnished by Mr. Edmund B. Ferrey.

Bishop's Sutton (Somerset).—The church here, built in 1848, has just been re-opened, after having been thoroughly repaired and cleaned, and the chancel entirely refitted and embellished. The organ, which formerly blocked up the north side of the chancel, has been removed to the east end of the south aisle. New oak chancel stalls and prayer desks of handsome design have been added, and a rich encaustic tile pavement laid down of Godwin's make from the architect's design. There have also been provided a new altar rail of oak carried on ornamental wrought-iron standards, an oak altar table, a stone credence, and Caen stone reredos. All the chancel windows have been reglazed with ornamental lead quarries of cathedral rolled glass and white glass intermixed. The chancel roof and walls have been cleaned and improved. Six pendants, of brass, light the chancel. The works to the chancel have been carried out under the direction of Mr. Edmund B. Ferrey, architect, by Mr. Vallis, builder, of Frome, aided by other tradesmen.

Higher Broughton.—On July 30th Mr. W. S. Clowes, M.P., laid the foundation-stone of a new church in Great Cheetham-street, Higher Broughton, to be dedicated to St. James. The church is to be built of brick and terra-cotta. It will be in the Decorated style, and is to accommodate 600 persons. The nave will be 86 ft. long by 26 ft. wide, with five arches; the chancel, 36 ft. long and 25 ft. wide. The height from the floor to the wall-plate of the nave will be 30 ft., and the height to the ridge, 50 ft. There will be north and south porches at the west end. The interior of the roof will be of pitch pine. The church is to be lighted by large three-light windows in the side walls, by a five-light window at the east end, and by two three-light windows at the west end. Messrs. Paley & Austin, Lancaster, are the architects, and Messrs. Foreman & Todd, Higher Broughton, the contractors. The cost will be about 7,000*l.*

Books Received.

An Essay on New South Wales, the Mother Colony of the Australias. By G. H. REID. London: Trübner & Co.

UNEXAMPLED prosperity has attended New South Wales during the past few years, and this essay, which comes to us from the Government of the colony, seeks to make this fact widely known, and to show that it is the best place in the world for the right sort of people to settle in. Our convictions go a long way with the writer. High wages, short hours, good living, and fine weather; that is the promise Mr. Reid makes to every persevering and respectable working man going to New South Wales. The progress of the colony has certainly been extraordinary. Mr. Reid says more land has passed into private hands in the last five years than in the previous eighty-three years. The area disposed of by auction and conditional sale at 1*l.* per acre and upwards from 1871 to 1875 was over 8,200,000 acres, and, at the same rate, it will take about 180 years to dispose of the area still available. As regards commerce, not very long ago nearly the whole of the colony's trade was engrossed by the mother country. Now they have a colonial and foreign trade of upwards of 15,000,000*l.*; the trade with the United Kingdom having, moreover, doubled during the last ten years. Mr. Reid gives a glowing account of the climate, describes as indescribable the beauty of Sydney harbour, and speaks with a glow of satisfaction of the plenty and happiness apparent amongst all classes of the population. In fact, if we read any further the chances are we shall shut the inkbottle and be off to New South Wales.

Concrete: Its Use in Building and the Construction of Concrete Walls, Floors, &c. By THOMAS POTTER. London: Spon; and Reynolds & Co., Southwark-street.

IT would be very easy to find fault with this treatise. It is to a great extent a compilation, the sources sometimes acknowledged, sometimes not, and the scholarship shown is limited; but, on the other hand, it includes a considerable amount of practical information on the subject with which it deals, and does not run into extremes. The value of concrete as a building material, under certain circumstances, and when properly made, is now so widely recognised, partly through the continued advocacy of the *Builder*, that plain straightforward instructions, whereby failure may be avoided and a

successful result ensured, are constantly asked for. To such inquirers, and we have had many, we recommend the little volume before us.

With reference to one of the objections we made at starting, we will give an instance. Mr. Potter says "Mr. Reid appears to have been the first, in his work on 'Concrete'" [a work Mr. Potter has made good use of], "to have used the word 'matrix' for the cementitious ingredient, although it is somewhat difficult to understand why this should be so, a matrix generally being supposed to mean 'a mould or cavity,' and therefore would apply more correctly to the space or void in which the concrete is to be deposited;" and he elsewhere speaks of the impropriety of the term. If he had turned to his dictionary he would have avoided this show of ingratitude, for he would have discovered that in mineralogy the term has been applied for long years to the earthy material in which mineral ore or organic remains are embedded!

Nevertheless, we adhere to our recommendation.

The Plumber and Sanitary Houses. By S. STEVENS HELLYER. Batsford, No. 52, High Holborn.

THIS is a practical treatise on the principles of internal plumbing work, with reference to the best means for excluding noxious gases from our houses. It treats of traps, soil-pipes, wastes, lavatories, baths, closets, ventilation, and so on. It is illustrated with numerous diagrams, and tastefully got up. It is very disheartening to find, after all we have been saying for years about traps and drains, that it should still be necessary to print much that we find here. However, so it is. We should be glad if every plumber in the kingdom would buy the book; this would give a good sale to Mr. Hellyer, and a good lift to sanitary plumbing.

Works in Iron: Bridge and Roof Structures. By EWING MATHESON, M. Inst. C.E. 2nd Edition. London: E. & F. N. Spon. 1877.

SEEING that all the examples of structures given in Mr. Matheson's work were made and erected by Messrs. Handyside & Co., of Derby, a casual examiner might be led to pronounce this a mere trade-book, and shut it up doubtingly. This, however, would be a great mistake. The book is brimful of most valuable practical information, and may be studied by those concerned with the greatest advantage. We spoke well of the first edition, and we can speak even more warmly of the second, because we know the book better.

Miscellanea.

The Measurement of Gas.—An important question brought under the notice of the Standard Weights and Measures Department is (says the Warden of the Standards in his report for the past year, just issued) the question of testing the index of a gas-meter. At present the inspector of gas-meters is not required by law to examine into the accuracy of the index, and consequently gas-meters are stamped as correct, although the inspector's examination is a partial one. Three recent instances have been reported to the Standards Department in which consumers of gas were charged for gas much in excess of what they had consumed, owing, as it was subsequently accidentally discovered, to the inaccuracy of the index only. In one instance a "3-light" meter registered five times more than was really consumed; in a second instance a "300-light" meter registered three times more than was really consumed; and in a third instance a gentleman of Torquay complained that his meter, though stamped as correct, had been found to register 86,000 ft. in excess. The whole system of testing gas-meters seems (says the *Pall Mall Gazette*) to be conducted in rather a "happy-go-lucky" fashion; for it is mentioned in the report that on the officers of the Standards Department examining the condition of the working standard gas measures used by the inspectors of London, Edinburgh, and Dublin in the actual testing of gas-meters, it was found that in no case had these working standards been reverified since their original verification in 1860. The condition of the working standards issued to other places is probably similar. After a period of seventeen years the errors of these working instruments may now be considerable, and the accuracy of any results obtained from them is doubtful.

The Masons' Strike.—The operative masons of London appear to be on the winning side—at all events for the present—in their contest with their employers, notwithstanding the cry of "No surrender" so vigorously put forth on behalf of the masters at the outset of the struggle. At a meeting of masons held on Wednesday evening in Cambridge Hall, Newman-street, Oxford-street, the chair was occupied by Mr. H. Broadhurst, who said the position they occupied was considerably better than it was last week. Since their last meeting two firms had been added to the list of those who had consented to give the 10d. an hour. One of these firms was that of Messrs. Lawrence, the other that of Messrs. Peto, of Pimlico. Since their last meeting their cause was being taken up by their provincial brethren in the most hearty and unanimous manner. Last week it was the committee's pleasing duty to announce that the trade of the town of Birmingham and its district had resolved to levy themselves in order to increase the men's already respectable dividend, which they received in addition to their strike-pay. Since that time the brethren of Bristol had met and determined to levy themselves 1s. a week to support the masons on strike in London. The Scottish society, which now stood the first trade society in Scotland (the Scotch masons) had resolved to do their best to support the men on strike—if not materially, at least with such an amount of "moral support" as in former years they had not always received from Scotland.—Mr. Hancock, the secretary, made a report. He said the number of men on strike had considerably decreased since their last meeting. In reality, three firms had since given the 10d. an hour. In the letter of Mr. Goulden, on the part of the employers, it was stated that fourteen firms had 376 men employed on the old terms. If so, they must be labourers. He defied Mr. Goulden to show that there were thirty masons working for these employers. Mr. Phillips then proposed:—"That in consideration of the progress hitherto made with respect to the advance, we, the masons of London, being fully sensible of the justice of our claims, are unwavering and unanimous in our decision, and are determined to adhere to the resolution passed at our last general meeting." Mr. Redmond, in seconding the motion, said no doubt they were able to carry on the struggle for months to come, but they wished for an amicable settlement. In Scotland, the society were not only determined to prevent men from coming to London, but to help them over the winter. Mr. Nisbitt suggested that advertisements should be inserted in foreign papers to prevent men coming to England. The chairman said foreign workmen would be dear bargains. They were tried in 1859, and an English mason would do six jobs while a foreigner was "squaring" round it lighting his cigarette. The motion was carried.

Industrial Dwellings for Newcastle-on-Tyne.—At a meeting of the Newcastle Industrial Dwellings Company on the 27th ult., it was resolved to proceed with the proposed extensions to the company's buildings. The additions will comprise sixty-four dwellings of not less than two rooms to each, including five shops, two of which will have two rooms to each. It is intended to provide a large room, about 50 ft. by 15 ft., to be used as a reading-room and library, and for any other purpose available for the mental improvement or rational amusement of the tenants. The following tenders for the various works in connexion with the new buildings have been accepted:—Mason and bricklayer, J. & E. Middlemiss; carpenter and joiner, J. Grisdale; slater, R. Carr; plumber, H. Cable; plasterer, Thos. Wallace; painter and glazier, A. Robertson. The entire cost of the extensions, including cost of land, will be about 10,500*l.*

Work on Table Decoration.—We are told that an entirely novel work on this subject is in the press. Messrs. Wyman & Sons, publishers, Great Queen-street, London, announce early in October "Floral Designs for the Table," being plain directions for its ornamentation with cut flowers and fruit, with classified lists of suitable plants, berries, and leaves. The work will be in folio size, and will contain twenty-four original Coloured Designs (executed in a high style of Chromo-lithography), showing the best and most attractive method of decorating the Breakfast, Luncheon, Dinner, and Supper Table at a moderate cost.

Upsala Cathedral.—The *Times* correspondent writes:—The Upsala Cathedral, in which the official festivities connected with the centenary of the university are held, is a very fine and imposing specimen of old Gothic architecture, though somewhat spoilt by the vandalism of later ages. It is built of large red bricks, with portals of stone, and dates from the thirteenth century, though it was finished only in 1435. A French architect, Etienne Bonneville, was the author of the design, which was, however, altered during the construction. The cathedral had originally three towers, the lofty spires of which rose to a height of 400 ft., and were of an elaborate design; but after the great fire of 1702, which destroyed the church and laid half the town in ashes, these Gothic spires were replaced by two square towers of only half the height, and strangely contrasting with the style of architecture preserved in the main construction. The interior is still very grand, with the twenty-four columns supporting the nave and the choir, and the arches rise majestically; but the whitewash with which even the marble columns and capitals have been covered to hide the traces of smoke and fire gives to the whole a monotonous character. The shrine containing the relics of St. Erik, the patron of the church and the Saint among Sweden's kings, has still its place near the altar. In the Gustavian Chapel are the last resting-places of several kings of the Wasa dynasty, the last male scion of which died some few weeks ago an exile. The founder of the house, Gustavus I., is lying in marble between two of his queens, a work of Flemish art; and over one of his sons, King John, is raised a monument, the marble figure of which is due to the chisel of Donatelli, but having been shipwrecked on its way to Upsala, was hidden for many years in a Dantzic warehouse.

"Lightning Protection."—The *Finance Chronicle* says,—Builders, from observation and experience of damage done by lightning to buildings, might be expected to know better than to construct a house for their personal use *minus* a lightning-rod. Yet we are told that this is frequently found to be the case; and a recent lightning-storm which passed over Warwickshire has furnished us with a signal proof of their indifference to the use of such a safeguard. We read in the local papers that on the 16th ult. the lightning struck the house of Mr. Brown, Dover-street, Coventry, and not having a lightning-conductor, it received "much damage. The chimney was shattered, the pots were completely broken, the pieces of one even thrown into the window of the house opposite, the staples were torn off, a rent was made in the wall, a portion of the iron palisading was twisted, &c." There is nothing unusual in this; but when the accident happened to the house of a builder there is much in it to surprise one, and which calls for comment.

Railway Mileage in the United Kingdom. A general report to the Board of Trade states that

The total mileage for the United Kingdom at the end of December, 1876, was 16,672 miles, including 11,989 miles for England, 2,726 for Scotland, and 2,157 for Ireland. The increase for the United Kingdom over the total in 1875 is 214 miles, which is much the same amount of increase as in 1875 over 1874. The per-centage of increase is in both cases about 1·3 per cent., which is a small rate of increase as compared with what has often been witnessed, and much smaller than the rate of increase in 1874, and one or two years just previous. Almost the entire increase in 1876 has been in England and Wales, the increase in Scotland being five miles only, and in Ireland nine miles. The increase of double mileage is greater than the increase of the whole mileage. Of the above total of 16,672 miles the number of double miles was 9,169, and of single miles 7,703; and, comparing these with the corresponding details for 1875, we find that while the increase of double miles has been 271, there has been a decrease of fifty-seven miles in the single mileage.

Maidstone Bridge.—A new bridge is to be constructed across the Medway at Maidstone, from the designs of Sir Joseph Bazalgette. The estimated cost is 32,000*l.* The bridge is to be of stone, and the Local Board are all in favour of such a bridge. Some of the ratepayers, however, are in favour of an iron bridge; they claim for it that it would be cheaper, more elegant, and could be erected in one span, and ask why all the modern bridges, such as those of Westminster, Blackfriars, &c., are built of iron if stone is preferable. To this the Local Board reply that iron bridges require constant painting, are less durable, and are only adopted in London because "the constructors, being limited in funds, have to use, not the best, but the cheapest materials." Tenders are invited for the stone bridge, and must be sent in on the 24th inst.

Mortality in Madras.—A sad story reaches us as to the mortality which has occurred at the Buckingham Canal, a work intended for the relief of famine sufferers. Out of twelve non-commissioned officers of the Royal Engineers appointed to that work, three have died, and four are on sick leave. It need scarcely be said that 25 per cent. is a death-rate which the famine itself in its wildest moments has never reached. The Government has called for a report, and from it we learn that "this alarming sickness and mortality are attributed to want of acclimatisation, physical unfitness, overwork, exposure to the sun, insufficient shelter, and want of food and provisions suitable for Europeans." So says Mr. O'Shaughnessy in charge of the work. Our own information says overwork and insufficient food were the chief causes.

Change of Name.—The Royal Engineer Department, a branch of which is established at most military stations, is (according to the *Daily News*) the subject of a royal warrant just issued. The title of "clerk of works" is to be altered to "assistant surveyor," and the pay of the civil professional branch of the Department is fixed on the following scale:—Chief surveyor, 800*l.*, increasing by 40*l.* yearly to 1,000*l.*; first-class surveyor, 400*l.*, increasing by 20*l.* yearly to 500*l.*; second-class surveyor, 300*l.*, increasing by 15*l.* annually to 375*l.*; assistant surveyor, 180*l.*, increasing by 10*l.* yearly to 280*l.* The warrant gives power to the Secretary of State for War to grant in special cases extra-duty pay, ranging from 100*l.* to 250*l.*, in addition to the foregoing rates.

The Telephone in Mining Operations.—On the 4th inst., Dr. Foster, Government Inspector of Mines, and his brother, an electrician, conducted experiments at the Eliza Mine, St. Austell, Cornwall, with the telephone, which had never before been tried in a mine. The little instrument, attached to a covered copper wire, was sent down the ventilating shaft, and within a quarter of an hour speaking at the bottom of the mine was distinctly heard, even more audibly than in the mine, where whispers at the top and songs were sung, and questions were asked and answered, demonstrating its thorough adaptability to mines. The importance of telephones in mining operations seems considerable, as the wire and instrument are portable, and can be carried to the extreme point of any mine.

An American Canal.—A water highway from St. Paul, Minnesota, to New Orleans, a distance of 2,000 miles, has just been opened, the last obstruction to navigation — the Des Moines Rapids—having been overcome by the building of a Government canal, now nearly completed. The canal is seven miles and six-tenths long, 300 ft. wide in embankment, and 250 ft. wide in excavation. The water in the canal will be from 5 ft. to 8 ft. deep, which is sufficient to float the steam-boats of the Upper Mississippi. The two lift-locks and one guard-lock, which are built of cutstone masonry, consumed most of the money expended on the work. The original estimate of cost was $3,390,000, but changes in the plans were, of course, made, and the cost has already reached $4,281,000.

Proposed Corporate Buildings at Sunderland.—On the 30th ult. Mr. J. T. Harrison, C.E., an inspector of the Local Government Board, opened an inquiry in Sunderland with reference to the application on the part of the Sunderland Corporation to the Treasury, to sanction a loan of 22,000*l.* for the proposed purchase of the Victoria Hall, and the erection of buildings on the site adjoining the same for municipal offices and corporate purposes. After hearing some formal evidence, the inquiry was adjourned until the 25th inst.

Death of Mr. John Piggot, Jun., F.S.A. We regret to announce the death, on the 30th ult., of Mr. John Piggot, jun., of the Elms, Ulting, Maldon. Mr. Piggot was a member of the council of the Essex Archæological Society, for whose *Journal* he wrote many interesting papers. For a short time he was proprietor and editor of a periodical entitled *Long Ago*, which was ultimately abandoned. He was also an occasional contributor to the *Art Journal* and to our own columns.

Proposed Aquarium, Waverley Market, Edinburgh. — A sub-committee of the Lord Provost's Committee on Markets has decided in favour of letting on lease for 200*l.* per annum a portion of the Fruit and Vegetable Market, for the purposes of an aquarium.

Kew Gardens.—The select vestry of Richmond have unanimously passed a resolution pledging themselves to do all in their power to assist the Kew Gardens Rights Defence Committee in their effort to obtain the opening of Kew Gardens at an earlier hour than at present, and to the substitution of an iron railing for the unsightly brick wall bounding the gardens in the Richmond-road. Dr. Selle, in proposing the resolution, observed that no fewer than 58,000 persons visited the gardens last Bank Holiday, and a great number, being ignorant of the hour of opening, were kept waiting about outside for a long time.

Improved Dwellings and the Rate of Mortality.—Dr. Bateson, the medical officer of St. George the Martyr, Southwark, in issuing a report on the health of the parish for the year ending March last, points out that the death-rate is reduced from twenty-four per 1,000 persons living in the previous year, to twenty-one and a half per 1,000 this year. He also states that the mortality shown by Peabody's-buildings, Blackfriars-road, gave evidence of the health enjoyed by those who dwelt there; whilst twenty-one and a half died in 1,000 living in the district, but twelve and a half died to the same proportion of persons in the buildings.

Gas from Wood.—At Tagil, in Russia, says Mr. John Milne, F.G.S., many of the shops and foundries are lighted by gas which is made from wood,—200 cubic feet of wood giving about 800 cubic feet of gas. The roots of pine and the rind of birch furnish the largest quantity of gas. The light from this gas is poor as compared with that made from coal, the former being equivalent to about ten candles, whilst the latter is equal to about fourteen. It is, however, cheap,—one jet costing half a kopec (one-sixth of a penny) per hour.

Ornamental Churchyards in London.—The Rev. W. Abbott, the rector, and the churchwardens of St. Luke's, Oldstreet-road, applied to the Chancellor, at the Consistory Court, on the 24th ult., for a faculty to convert the closed burial-ground of the parish church of St. Luke's into an ornamental place for trees and flowers. There was no opposition to the plan, and the inhabitants were in favour of the proposed improvements. The Chancellor said the faculty would be given in a few days.

The Romford Lighting Scheme.—At the last meeting of the Romford Local Board the tender of Mr. Dietz was accepted for altering the public gas-lamps according to his patent for burning oil, and the tender of Mr. E. Pertwee, a local oilman, was accepted for the supply of white petroleum (120 degrees) at 1*s.* 2*d.* per gallon for lighting the lamps.

The Walker Art Gallery, Liverpool, was opened by the Earl of Derby on the 6th inst. The building, as our readers know, has been erected at the cost of Mr. A. B. Walker, the mayor, by whom it has now been formally presented to the town. Mr. Sherlock is the architect, and the cost has been about 40,000*l.* We have already given a view of the building.

The Post-office Savings-Bank.—According to the *City Press*, a new building is about to be erected in Queen Victoria-street to accommodate temporarily the Central Savings-Bank, until permanent provision can be made for that and other departments for which there is at present no accommodation in the General Post-office buildings, St. Martin's-le-Grand.

Brighton.—At a meeting of the Brighton Town Council a communication was read from the Local Government Board sanctioning the purchase of the East Lodge estate, and the borrowing of two sums of 6,000*l.* for works in connexion with street improvements.

TENDERS.

For alterations to the Temple Club, Arundel-street, Strand, for Mr. C. H. Russell. Messrs. Dunn & Tylor, architects. Quantities by Mr. T. Nixon:—

Bowyer & Son	£25,000 0 0
Morter	19,487 0 0
Williams & Son	19,400 0 0
Killby	19,327 0 0
Patrick & Son	19,190 0 0
Sewell & Son	19,169 0 0
Howard & Co.	18,950 0 0
Rider & Son	18,888 0 0
Adamson & Son	18,502 0 0
Longmead & Wey	18,347 0 0
Hook & Oldrey	17,947 0 0

For rebuilding Nos. 316 and 318, Bethnal-green-road, for Mr. Borton. Messrs. Stone, architects:—

Stamp & Bowtle	£1,993 0 0
Brett	1,955 0 0
Lewis	1,937 0 0
Atherton & Latta	1,867 0 0
Goodman	1,835 0 0
Hunt	1,728 0 0
Forrest	1 694 0 0
Johnson	1,663 0 0
Judd & Hawkings	1,659 0 0
High	1,390 0 0

For villa residence, for Mr. J. C. M'Leod, on the Woodside Estate, Finchley. Mr. G. H. O'Donogue, architect:—

Messrs. Toms	£1,280 0 0
Gibbon & Mitchell	1,250 0 0
Ball & Wicks	1,185 0 0
Gould & Brand	1,155 0 0
Wall, Brothers	1,154 0 0
Aitchison & Walker (accepted)	1,057 0 0

For piers, wing walls, gates, and railings, at Manor Park, Essex, for the Manor Park Cemetery Company, Limited. Mr. Herbert J. Jones, architect. Ironwork by the Coalbrookdale Company:—

Williams (accepted)	£500 0 0

For cottage and coach-house, at Westbury-on-Trym, near Bristol, for Mr. Joseph Watkins. Mr. Herbert J. Jones, architect:—

Brookes	£176 14 0
Williams (accepted)	176 0 0

For drainage works, at Sussex-place, Bristol. Mr. Herbert J. Jones, surveyor:—

Humphreys	£190 0 0
Ford (accepted)	163 3 0

For rebuilding 36 and 37, Poultry:—

Anstag	£4,610 0 0
Beale	4,575 0 0
Bracher	4,560 0 0
Kirk	4,537 0 0

Accepted for works in connexion with the extension and alteration of the Corn Exchange, Rainburgh:—

Bishop & Son (masonry)	£3,181 0 0
Pullar (joiner-work)	1,160 0 0

For residence, for Mr. John Jarratt, at Forest-road, Loughborough. Mr. George Hodson, architect. Quantities supplied:—

Needham	£1,268 11 0
Barker	1,091 0 0
Harding	1,025 0 0
Ludlam	1,013 0 0
Main	989 12 0
Johnson, Brothers (accepted)	940 0 0

For Wesleyan Chapel, at Sheepshed, Leicestershire. Mr. George Hodson, architect. Quantities supplied:—

Aspell	£1,535 0 0
Johnson, Brothers	1,430 0 0
Needham	1,422 0 0
Wright, Brothers	1,309 10 0
Books	1,330 0 0
W. & J. Main	1,320 13 0
Ludlam (accepted)	1,225 0 0

For the taking down and re-erection of the Buck Inn, at Clay Cross, Derbyshire. Messrs. Rollinson & Son, architects:—

Askew	£2,145 0 0
Clubley & Stringfellow	2,080 0 0
Tutin	2,029 0 0
Fidler	2,027 0 0
Broomhead	2,008 0 0
Hays	1,980 0 0
Hodson & Facon	1,935 0 0
Bingham	1,900 0 0
Brown (accepted)	1,897 0 0

For stabling, coach-house, &c., at 38, Grosvenor-place, for Mr. J. G. Morris. Mr. Alfred Waterhouse, architect. Quantities by Mr. T. M. Rickman:—

Perry & Co.	£2,155 0 0
Smith & Co.	2,007 0 0
Holland & Hannen	2,033 0 0
Lascelles	2,032 0 0
Higgs & Hill	1,984 0 0

For altering two villa residences to one house, at Woodriding, Pinner, Middlesex, for Mr. Tandy. Mr. Hide, architect:—

Temple & Forster	£2,056 0 0
J. & J. Greenwood	2,017 0 0
Williams & Son	1,831 0 0
Beckey	1,750 0 0

For lengthening present car-sheds, at Queen's-road, Peckham, for the London Tramways Company, Limited:—

Taylor	283 0 0
Holliday (accepted)	257 0 0

For works, 3, King's-road, Bedford-row, for Shum, Crossman, & Crossman. Mr. J. Lavender, architect. Messrs. Raynes & Shum, surveyors:—

		Repairs to old house.
Atfield & Son	£1,750	£165
Manley & Rogers	1,730	160
Patman & Fotheringham	1,445	170
Axford	1,367	130
Langmead & Way	1,295	125

For the erection of stables, &c., to be known as Horbury Mews, Ladbrook-road, Notting-hill, for Mr. R. Cooke. Mr. W. J. Worthington, architect:—

Longmire & Burge	£11,998 0 0
Clemence	11,949 0 0
Cowland	11,846 0 0
Butt	11,792 0 0
Clark & Bracey	11,380 0 0
Outhwaite & Son (accepted)	10,770 0 0

For addition to No. 12, Wigmore-street. Mr. Hughes, architect:—

Manley & Rogers	£2,477 0 0
Colls & Son	2,476 0 0
Bywaters	2,458 0 0

For alterations and additions to Belmont, Uxbridge, for Mr. C. W. Wakefield. Mr. E. J. Shrewsbury, architect:—

Silver & Son (accepted)	£2,648 18 6

For sewers, for the Vestry of St. Leonard, Shoreditch. Mr. G. C. Perrett, surveyor:—

Coker	£7,621 0 0
Wainwright	6,050 0 0
Groom & Scrowen	5,900 0 0
Waddingham	5,193 0 0
Cooke	5,100 0 0
Killingback	4,920 0 0
Wall, Brothers	4,875 0 0
Dover & Sons	4,687 0 0
Wood, Brothers	4,620 0 0
Keeble	4,607 0 0
Docwra	4,450 0 0
Nowell & Robson	4,449 0 0
Pearson	4,443 0 0
Prout	4,365 0 0
Riley	4,350 0 0
Thompson & Sons	4,250 0 0
Dunmore	4,225 0 0
Pizzey	4,210 0 0
Bloomfield	4,187 0 0
Stamp & Bowtle	4,149 0 0
Crockett	4,139 0 0
Waldram & Co.	3,997 0 0
Ford & Norris	3,893 0 0
Nobbs	3,820 0 0
Williams, Son, & Wallington	3,781 0 0
Rendall (accepted)	3,166 0 0

For alterations to, and building, stables, at The Beeches, Walton-on-Thames, for Mr. J. W. Wilson. Mr. G. Legg, architect:—

Woods	£4,380 0 0
Brighton	4,160 0 0
Shurmur	3,986 0 0
Knight & Simpson	3,916 0 0

For alterations, at Woodcote Hall, Epsom, for Mr. C. F. Murray. Mr. G. Legg, architect:—

Little	£2,391 0 0
Brighton	2,120 0 0
Shurmur	2,097 0 0

For new conservatory, and recess on staircase, at Clavering House, Clapham-common, for Mr. T. Pugh. Mr. James Barnett, architect:—

Staines & Son (accepted)	174 0 0

For alterations and additions, Boyn-grove, Boyn-hill, Maidenhead, for Mr. J. C. Wootton. Mr. Edwin A. B. Crockett, architect:—

Bolton	£2,469 0 0
Cox	2,455 0 0
Woodroffe	2,400 10 0
Woodbridge	2,370 0 0
Silver & Son	2,365 0 0
Bayes, Brothers, & Allen *	2,351 0 0

* Accepted.

For the erection of storehouse, Rowatt's Wharf, Bow, E., for Messrs. Roberts & Johnson. Mr. Edwin A. B. Crockett, architect:—

Conder	£319 0 0
Bayes, Brothers, & Allen *	296 0 0
Gregar	290 0 0

* Accepted.

For alterations, new bar-fittings, repairs, and decorative work, at the Carlisle Arms, Queen-street, Soho, for Messrs. Melvin & Co.. Mr. F. R. Hayes, surveyor:—

Mansell	£1,429 0 0
Wescombe	1,387 0 0
Chamberlen	1,330 0 0
Wilson	1,297 0 0

For St. Saviour's Church Mission Room and Sunday School, Fleet-road, Haverstock-hill. Messrs. Batterbury & Huxley, architects:—

Scrivener & White	£2,535 0 0
Downs & Co.	2,490 0 0
Newman & Mann	2,441 0 0
Manley & Rogers	2,328 0 0

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H. B. W.—C. L.—J. T. R.—C. M.—S. H.—J. G.—W.—R. L.—J. M.—W. W. L.—L. & W.—H. H.—S. R. & Son.—G. H.—J. H.—W. H. L.—G. M.—R. T. G.—J. W. S.—W. H.—C. E.—G. M.—S. H. T.—P. P.—J. W.—J. H. J.—W. S.—F. & R.—W. R. (we cannot assist in sending the obelisk to the top of Primrose Hill).—B. F. (next week).

We are compelled to decline pointing out books and giving addresses.

All statements of facts, lists of tenders, &c. must be accompanied by the name and address of the sender, not necessarily for publication.

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[*See also p.* xxiv.

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Erections comprise: Two saw mills, store-rooms, engine-house, boiler-shed, carpenter's shop, offices, stabling, harness-room, &c.
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